

Heller nucut



"Job Tempered"

Tools

HELLER TOOL CO

AMERICA'S OLDEST FILE MANUFACTURER

C-57

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HELLER TOOL CO.

A SUBSIDIARY OF SIMONDS SAW AND STEEL CO.

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NEWCOMERSTOWN, OHIO

BRANCHES: UNION, N. J., DETROIT, CHICAGO
SHREVEPORT, LA., LOS ANGELES,
PORTLAND, OREGON

HELLER NUCUT®

AMERICAN PATTERN FILES

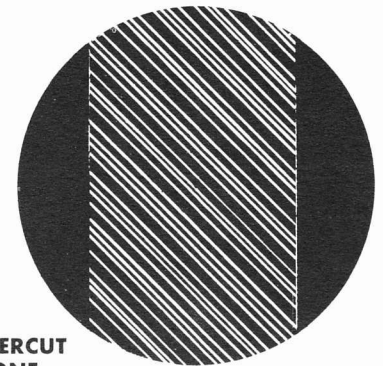
Double action with Heller's exclusive "Wavy-Teeth"

The Heller NUCUT "Wavy-Teeth" principle is one of the most important advances in recent file history. The combination of fine and coarse teeth illustrated explains why this is the fastest cutting file for equal size and coarseness of any available.

Proved by 20 years of industrial use, the patented "Wavy-Teeth" design does two jobs at once.

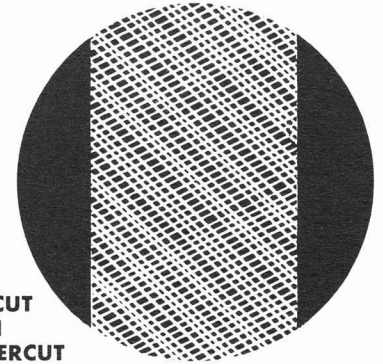
The coarse teeth remove more metal than a similar cut would. This means less pressure on the file and fewer strokes to remove an equal amount of metal. Thus the "Wavy-Teeth" file is easier to use and lasts longer.

While the coarse teeth are doing the work, the fine teeth break up the chips, permitting them to free themselves faster. This minimizes loading, reduces chatter and gives a smoother finish.



OVERCUT
ALONE

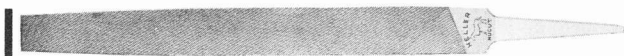
The overcut creates a pattern of coarse and fine teeth.



UPCUT
and
OVERCUT

When the upcut is added, the "Wavy-Teeth" design is created with larger cutting teeth and smaller cleaning teeth.

mill and saw files

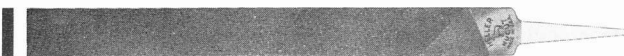


MILL FILES

SIZE	CUT	SIZE	CUT
4" x $\frac{3}{16}$ " x $\frac{3}{64}$ "	B-2-S	10" x $\frac{3}{32}$ " x $\frac{1}{64}$ "	C-B-2-S
6" x $\frac{1}{32}$ " x $\frac{3}{64}$ "	C-B-2-S	12" x $\frac{1}{32}$ " x $\frac{3}{32}$ "	C-B-2-S
7" x $\frac{1}{16}$ " x $\frac{1}{4}$ "	B	14" x $\frac{1}{16}$ " x $\frac{1}{4}$ "	C-B-2-S
8" x $\frac{2}{32}$ " x $\frac{3}{64}$ "	C-B-2-S	16" x $1\frac{1}{2}$ " x $\frac{3}{32}$ "	B

1 ROUND EDGE Made in 6", 8", 10" and 12" Bastard Cut Only

2 ROUND EDGES Made in 6", 8", and 10" Bastard Cut Only



SPECIAL CROSSCUT FILES

SIZE	SIZE	SIZE
6" x $\frac{1}{32}$ " x $\frac{7}{64}$ "	7" x $\frac{1}{16}$ " x $\frac{1}{8}$ "	10" x $\frac{3}{32}$ " x $\frac{1}{64}$ "
	8" x $\frac{2}{32}$ " x $\frac{3}{64}$ "	



BANDSAW (BLUNT) FILES

SIZE (REG)	SIZE (SLIM)
6" x $\frac{1}{32}$ "	6" x $\frac{3}{64}$ "
8" x $\frac{1}{32}$ "	8" x $\frac{1}{32}$ "



CANTSAW FILES

SIZE	SIZE
6" x $\frac{1}{32}$ " x $\frac{1}{64}$ "	8" x $\frac{1}{16}$ " x $\frac{3}{32}$ "
7" x $\frac{3}{64}$ " x $\frac{1}{4}$ "	10" x $\frac{1}{16}$ " x $\frac{1}{32}$ "



CROSSCUT FILES

SIZE	SIZE	SIZE
6" x $\frac{3}{16}$ " x $\frac{7}{32}$ "	8" x $\frac{1}{16}$ " x $\frac{3}{32}$ "	10" x $\frac{1}{16}$ " x $\frac{2}{64}$ "



REGULAR TAPER FILES

SIZE	SIZE	SIZE
6" x $\frac{1}{32}$ "	7" x $\frac{1}{32}$ "	10" x $\frac{2}{32}$ "
	8" x $\frac{1}{32}$ "	



SLIM TAPER FILES

SIZE	SIZE	SIZE
4" x $\frac{7}{32}$ "	6" x $\frac{1}{32}$ "	8" x $\frac{1}{32}$ "
5" x $\frac{3}{32}$ "	7" x $\frac{1}{32}$ "	10" x $\frac{5}{64}$ "



EXTRA SLIM TAPER FILES

SIZE	SIZE	SIZE
4" x $\frac{3}{64}$ "	5 $\frac{1}{2}$ " x $\frac{1}{4}$ "	7" x $\frac{3}{64}$ "
5" x $\frac{1}{64}$ "	6" x $\frac{3}{32}$ "	8" x $\frac{1}{32}$ "



DOUBLE EXTRA SLIM TAPER FILES

SIZE	SIZE	SIZE
4" x $\frac{3}{32}$ "	6" x $\frac{7}{32}$ "	7" x $\frac{1}{4}$ "
5" x $\frac{3}{16}$ "		8" x $\frac{3}{16}$ "



DOUBLE ENDER FILES

SIZE	SIZE	SIZE
6" x $\frac{1}{32}$ "	8" x $\frac{3}{32}$ "	9" x $\frac{1}{32}$ "
7" x $\frac{7}{32}$ "		10" x $\frac{3}{8}$ "

ALL ABOVE FILES AVAILABLE IN SINGLE CUT AS WELL AS WAVY TEETH

HELLER NUCUT[®]

machinists' files

C - COARSE
B - BASTARD
2 - SECOND
S - SMOOTH

GULLET SPECIAL

SIZE
8" x $\frac{5}{16}$ "

SIZE
10" x $\frac{3}{8}$ "

DADO FILE

SIZE
10" x $\frac{3}{8}$ "

HAND SAW SPECIAL

SIZE
5 $\frac{1}{2}$ " x $\frac{1}{4}$ "

SIZE
6" x $\frac{1}{2}$ "

SIZE
7" x $\frac{1}{2}$ "

NARROW BAND SAW SPECIAL

NO. 2
SIZE
8" x $\frac{3}{16}$ "

NO. 3
SIZE
6" x $\frac{1}{2}$ "
7" x $\frac{1}{2}$ "

NO. 456
SIZE
6" x $\frac{3}{8}$ "
7" x $\frac{1}{2}$ "

SAW BIT SPECIAL

SIZE
8" x $\frac{1}{16}$ " x $\frac{5}{32}$ "

chain saw files

ROUND CHAIN SAW FILES

SIZE	CUT	SIZE	CUT
8" x $\frac{3}{16}$ "	SMOOTH DC	8" x $\frac{1}{32}$ "	SMOOTH DC
8" x $\frac{7}{32}$ "	SMOOTH DC	8" x $\frac{3}{16}$ "	SMOOTH DC
8" x $\frac{1}{4}$ "	SMOOTH DC	8" x $\frac{5}{8}$ "	SMOOTH DC

MILL CHAIN SAW FILES—2 ROUND EDGES

SIZE	NO.	CUT
8" x $\frac{5}{8}$ " x $\frac{7}{32}$ "	3084	SC

LOZENGE CHAIN SAW FILE

SIZE	NO.	CUT
6" x $\frac{1}{32}$ " x $\frac{7}{32}$ "	3365	SMOOTH DC

FLAT FILES

SIZE	CUT	SIZE	CUT
4" x $\frac{1}{32}$ " x $\frac{3}{32}$ "	B-2-S	12" x 1 $\frac{5}{32}$ " x $\frac{3}{32}$ "	C-B-2-S
6" x $\frac{5}{8}$ " x $\frac{5}{32}$ "	C-B-2-S	14" x 1 $\frac{11}{32}$ " x $\frac{3}{16}$ "	C-B-2-S
8" x $\frac{25}{32}$ " x $\frac{7}{32}$ "	C-B-2-S	16" x 1 $\frac{17}{32}$ " x $\frac{1}{32}$ "	B-2-S
10" x $\frac{31}{32}$ " x $\frac{1}{4}$ "	C-B-2-S	18" x 1 $\frac{11}{16}$ " x $\frac{3}{8}$ "	B

HAND FILES

SIZE	CUT	SIZE	CUT
6" x $\frac{5}{8}$ " x $\frac{5}{32}$ "	B-2-S	12" x 1 $\frac{5}{32}$ " x $\frac{3}{32}$ "	B-2-S
8" x $\frac{25}{32}$ " x $\frac{7}{32}$ "	B-2-S	14" x 1 $\frac{11}{32}$ " x $\frac{3}{16}$ "	B-2-S
10" x $\frac{31}{32}$ " x $\frac{1}{4}$ "	B-2-S		

PILLAR FILES

SIZE	CUT	SIZE	CUT
6" x $\frac{7}{16}$ " x $\frac{7}{32}$ "	B-2-S	12" x $\frac{25}{32}$ " x $\frac{1}{32}$ "	B
8" x $\frac{9}{16}$ " x $\frac{3}{32}$ "	B-2-S	14" x $\frac{29}{32}$ " x $\frac{1}{32}$ "	B
10" x $\frac{21}{32}$ " x $\frac{1}{32}$ "	B-2-S		

HALF ROUND FILES

SIZE	CUT	SIZE	CUT
4" x $\frac{7}{16}$ " x $\frac{1}{8}$ "	B-2-S	12" x 1 $\frac{1}{8}$ " x $\frac{1}{32}$ "	C-B-2-S
6" x $\frac{15}{32}$ " x $\frac{5}{32}$ "	C-B-2-S	14" x 1 $\frac{3}{32}$ " x $\frac{1}{32}$ "	C-B-2-S
8" x $\frac{3}{4}$ " x $\frac{7}{32}$ "	C-B-2-S	16" x 1 $\frac{15}{32}$ " x $\frac{1}{32}$ "	B-S
10" x $\frac{15}{16}$ " x $\frac{7}{32}$ "	C-B-2-S		

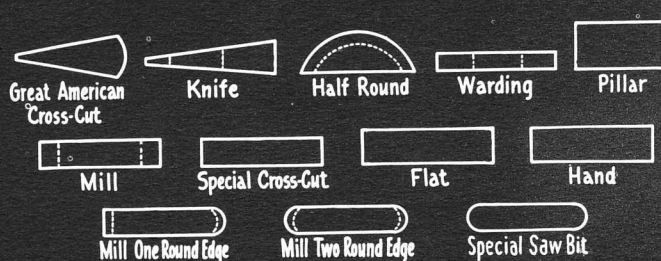
THREE SQUARE FILES

SIZE	CUT	SIZE	CUT
6" x $\frac{15}{32}$ "	B-2-S	10" x $\frac{3}{4}$ "	B-2-S
8" x $\frac{5}{8}$ "	B-2-S	12" x $\frac{27}{32}$ "	B

ROUND FILES

SIZE	CUT	SIZE	CUT	SIZE	CUT
4" x $\frac{3}{32}$ "	B-2-S	8" x $\frac{5}{16}$ "	B-2-S	12" x $\frac{1}{2}$ "	B-2-S
6" x $\frac{7}{32}$ "	B-2-S	10" x $\frac{3}{8}$ "	B-2-S	14" x $\frac{5}{8}$ "	B-2-S
7" x $\frac{1}{4}$ "	B			16" x $\frac{3}{4}$ "	B

CROSS SECTIONAL VIEWS OF COMMONLY USED FILES



American Pattern

FILES

SQUARE FILES

SIZE	CUT	SIZE	CUT	SIZE	CUT
4" x $\frac{5}{32}$ "	B-2-S	8" x $\frac{3}{16}$ "	C-B-2-S	14" x $\frac{5}{16}$ "	C-B-2-S
6" x $\frac{7}{32}$ "	C-B-2-S	10" x $\frac{3}{8}$ "	C-B-2-S	16" x $\frac{3}{4}$ "	B
		12" x $\frac{1}{2}$ "	C-B-2-S		



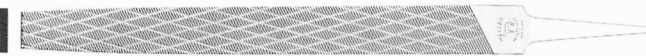
WARDING FILES

SIZE	CUT	SIZE	CUT
4" x $\frac{15}{32}$ " x $\frac{3}{64}$ "	B-2-S	8" x $\frac{25}{32}$ " x $\frac{3}{32}$ "	B-2-S
6" x $\frac{5}{8}$ " x $\frac{5}{64}$ "	B-2-S	10" x $\frac{15}{16}$ " x $\frac{1}{8}$ "	B-2-S
		12" x 1 $\frac{7}{64}$ " x $\frac{9}{64}$ "	B



KNIFE FILES

SIZE	CUT	SIZE	CUT
4" x $\frac{15}{32}$ " x $\frac{7}{64}$ "	B-2-S	8" x $\frac{27}{32}$ " x $\frac{3}{16}$ "	B-2-S
6" x $\frac{21}{32}$ " x $\frac{5}{32}$ "	B-2-S	10" x 1 $\frac{1}{32}$ " x $\frac{1}{4}$ "	B-2-S



MULTI-KUT FILES

FLAT SIZE	HALF ROUND SIZE	SQUARE SIZE
8" x $\frac{25}{32}$ " x $\frac{7}{32}$ "	8" x $\frac{3}{4}$ " x $\frac{7}{32}$ "	8" x $\frac{5}{16}$ "
10" x $\frac{31}{32}$ " x $\frac{1}{4}$ "	10" x $\frac{15}{16}$ " x $\frac{9}{32}$ "	10" x $\frac{3}{8}$ "
12" x 1- $\frac{5}{32}$ " x $\frac{9}{32}$ "	12" x 1- $\frac{1}{8}$ " x 11/32"	12" x $\frac{1}{2}$ "
14" x 1-11/32" x $\frac{5}{16}$ "	14" x 1-9/32" x 13/32"	14" x $\frac{5}{8}$ "

special purpose files



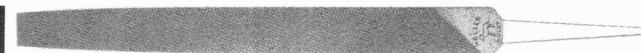
FLAT FOUNDRY FILES



HALF ROUND FOUNDRY FILES

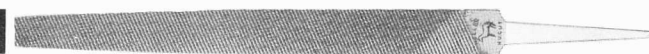
FOUNDRY FILES

FLAT FOUNDRY FILES SIZE	HALF ROUND FOUNDRY FILES SIZE
8" x $\frac{25}{32}$ " x $\frac{7}{32}$ "	8" x $\frac{3}{4}$ " x $\frac{7}{32}$ "
10" x $\frac{31}{32}$ " x $\frac{1}{4}$ "	10" x $\frac{15}{16}$ " x $\frac{9}{32}$ "
12" x 1 $\frac{5}{32}$ " x $\frac{9}{32}$ "	12" x 1 $\frac{1}{8}$ " x 11/32"
14" x 1 $\frac{11}{32}$ " x $\frac{5}{16}$ "	14" x 1 $\frac{9}{32}$ " x 13/32"



LONG ANGLE LATHE FILES

SIZE	SIZE	SIZE
10" x $\frac{31}{32}$ " x $\frac{1}{4}$ "	12" x 1 $\frac{5}{32}$ " x $\frac{9}{32}$ "	14" x 1 $\frac{11}{32}$ " x $\frac{5}{16}$ "



FLAT ALUMINUM



HALF ROUND ALUMINUM

ALUMINUM FILES—TYPE A

FLAT ALUMINUM SIZE	HALF ROUND ALUMINUM*
6" x $\frac{5}{16}$ " x $\frac{5}{32}$ "	6" x $\frac{19}{32}$ " x $\frac{5}{32}$ "
8" x $\frac{25}{32}$ " x $\frac{7}{32}$ "	8" x $\frac{3}{4}$ " x $\frac{7}{32}$ "
10" x $\frac{31}{32}$ " x $\frac{1}{4}$ "	10" x $\frac{15}{16}$ " x $\frac{9}{32}$ "
12" x 1 $\frac{5}{32}$ " x $\frac{9}{32}$ "	12" x 1 $\frac{1}{8}$ " x 11/32"

*NOTE: 6", 8" and 10" have narrow point. See brass file.

FLAT LEAD FLOAT



HALF ROUND LEAD FLOAT



LEAD FLOAT FILES

FLAT LEAD FLOAT SIZE	HALF ROUND LEAD FLOAT SIZE
8" x $\frac{25}{32}$ " x $\frac{7}{32}$ "	8" x $\frac{3}{4}$ " x $\frac{7}{32}$ "
10" x $\frac{31}{32}$ " x $\frac{1}{4}$ "	10" x $\frac{15}{16}$ " x $\frac{9}{32}$ "
12" x 1 $\frac{5}{32}$ " x $\frac{9}{32}$ "	12" x 1 $\frac{1}{8}$ " x 11/32"



BRASS FILES (half round only)

SIZE
8" x $\frac{3}{4}$ " x $\frac{7}{32}$ "
10" x $\frac{15}{16}$ " x $\frac{9}{32}$ "
12" x 1 $\frac{1}{8}$ " x 11/32"

— Has blunt point.
See Aluminum File.



MACHINISTS' SCRAPER

NUMBER	SIZE	NUMBER	SIZE
3144	5" x $\frac{13}{16}$ "	3147	5" x $\frac{5}{16}$ "
3145	6" x $\frac{1}{2}$ "	3148	6" x $\frac{11}{16}$ "
3146	7" x $\frac{9}{16}$ "	3149	7" x $\frac{13}{16}$ "
		3234	8" x $\frac{1}{2}$ "



DOCTOR BLADE FILES

NUMBER	SIZE	CUT
381	#381—14" x $\frac{1}{16}$ " x $\frac{9}{32}$ "	2



AUGER BIT FILES

SIZE
7" x $\frac{11}{32}$ " x $\frac{1}{16}$ "



CABINET FILES

SIZE	SIZE	SIZE
8" x $\frac{7}{8}$ " x $\frac{3}{16}$ "	10" x 1 $\frac{1}{8}$ " x $\frac{7}{32}$ "	12" x 1 $\frac{5}{16}$ " x $\frac{1}{4}$ "



FLAT WOOD FILES



HALF ROUND WOOD FILES

WOOD FILES

FLAT WOOD FILES SIZE	HALF ROUND WOOD FILES SIZE
8" x $\frac{25}{32}$ " x $\frac{7}{32}$ "	8" x $\frac{3}{4}$ " x $\frac{7}{32}$ "
10" x $\frac{31}{32}$ " x $\frac{1}{4}$ "	10" x $\frac{15}{16}$ " x $\frac{9}{32}$ "
12" x 1 $\frac{5}{32}$ " x $\frac{9}{32}$ "	12" x 1 $\frac{1}{8}$ " x 11/32"
14" x 1 $\frac{11}{32}$ " x $\frac{5}{16}$ "	14" x 1 $\frac{9}{32}$ " x 13/32"

rasps



FLAT WOOD RASPS



HALF ROUND WOOD RASPS

FLAT WOOD RASPS			
SIZE	CUT	SIZE	CUT
8" x $\frac{25}{32}$ " x $\frac{9}{32}$ "	B	12" x $1\frac{5}{32}$ " x $\frac{13}{32}$ "	B
10" x $\frac{31}{32}$ " x $1\frac{1}{32}$ "	B	14" x $1\frac{11}{32}$ " x $\frac{13}{32}$ "	B
HALF ROUND WOOD RASPS			
SIZE	CUT	SIZE	CUT
6" x $\frac{19}{32}$ " x $\frac{1}{4}$ "	B	12" x $1\frac{5}{32}$ " x $\frac{7}{16}$ "	B-S
8" x $\frac{25}{32}$ " x $\frac{5}{16}$ "	B-S	14" x $1\frac{11}{32}$ " x $\frac{1}{2}$ "	B
10" x $\frac{31}{32}$ " x $\frac{3}{8}$ "	B-S	16" x $1\frac{11}{32}$ " x $\frac{9}{16}$ "	B

HELLER NUCUT®

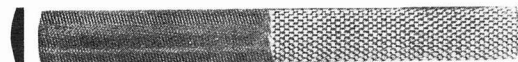
American Pattern

FILES



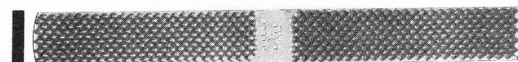
CABINET RASPS

SIZE	CUT	SIZE	CUT
6" x 1 1/16" x 3/16"	2	12" x 1 1/32" x 1/32"	2-S
8" x 2 3/32" x 1/4"	2-S	14" x 1 9/16" x 3/8"	2
10" x 1 1/8" x 9/32"	2-S		



SHOE RASPS

SIZE	CUT	SIZE	CUT
8" x 7/8" x 3/32"	{ ALL SPECIAL COMB.	10" x 1 1/16" x 1/32"	{ ALL SPECIAL COMB.
9" x 3 1/32" x 5/16"			



HORSE RASPS

PLAIN HORSE RASPS — REGULAR	TANGED RASPS — REGULAR	14" TANGED "RACE TRAK" RASP
SIZE 12" x 1 5/16" x 1/32" 14" x 1 1/2" x 3/8" 16" x 1 3/32" x 7/16"	SIZE 14" x 1 3/4" x 3/8" 16" x 1 7/8" x 15/32"	SIZE 14" x 1 3/4" x 3/32"
PLAIN HORSE RASPS — SLIM PATTERN	TANGED RASPS — THIN PATTERN	18" PLAIN "RACE TRAK" RASP
SIZE 18" x 1 1/16" x 1/32"	SIZE 14" x 1 3/4" x 1/32"	SIZE 18" x 1 1/16" x 1/32"

ignition files



5" PATENTED TUNGSTEN
POINT FILES (POCKET CLIP)



5" REGULAR TUNGSTEN
POINT FILES



5" VOLTAGE REGULATOR
FILES No. 2470



6" VOLTAGE REGULATOR
RIFFLERS No. 1997

Clip handle fits over pocket flap for easy carrying. A necessary tool for every auto mechanic. Used for cleaning spark plugs and dressing contact points. Packed in boxes containing a dozen files. Also mounted on cards (one dozen to a card).

For cleaning distributor points and spark plugs. Also used in cleaning contact points of magnetos, switches, electric bells, etc. Made with chisel tip for entering gaps and slots. Packed in boxes containing one dozen files and also mounted on cards (one dozen files to a card).

For voltage regulators, circuit breakers, relay and other electrical contact points requiring an extra-thin file with fine cut and smooth finish. 5" over-all—3/16" wide, approximately .020" thick. Packed on counter display cards only, one dozen on card—twelve cards to a carton.

Recommended for removing pits and corrosion from contact points and also for filing them to a smooth finish. Length 6" over-all. Packaged on counter display cards only. One dozen on card—twelve cards to carton.

all purpose files



ROTARY MOWER and GARDEN TOOL

SIZE 7" x 3/4" x 1/8"



FARMER'S OWN

SIZE 8" x 3 1/32" x 1/64"

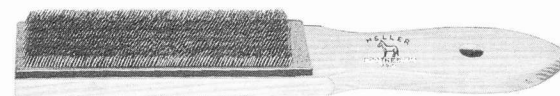
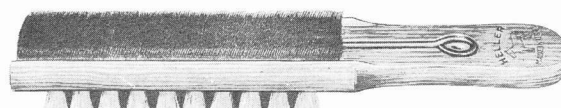


ALL PURPOSE FILES

SIZE
8" x 3 1/32" x 3/16"
10" x 3 1/32" x 3/16"

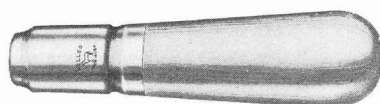
SIZE
12" x 1 3/32" x 3/32"
14" x 1 1/32" x 3/16"

file cards



When file teeth are clogged with filings—slipping, scratching and inefficient cutting result. Clean your coarse file frequently with a file card (specially designed fine wire brush), and use the brush on your fine cut file. The combination file card and brush provides both card and brush, with a specially designed pick, in one handy cleaning tool.

file handles



SIZES

#104	4" for small files
#106	4 1/2" for files 4" to 8"
#108	5" for files 8" to 10"
#110	5 1/2" for files 12" to 14"
#112	6" for files 16" to 20"

Standard carton contains 1/4 gross of a size. A handle should always be used on a tanged file. A properly fitted handle means quicker, better work, and makes the job easier and safer. Heller handles are manufactured of soft wood and readily absorb hand moisture. Long shank steel ferrule prevents splitting.

STANDARD TOOTH CUTS

The illustrations at left serve only to show a cut comparison between four various types of ten-inch files. Bear in mind that the coarse cut illustrated for any ten-inch file would not be the same degree of coarseness as that found on the same file in a six-inch length. However, the same relative difference always exists between Bastard, Second Cut and Smooth Cut for any file in any particular length.

10"
MILL



BASTARD

2ND CUT

SMOOTH

10"
FLAT



BASTARD

2ND CUT

SMOOTH

10"
HALF
ROUND



BASTARD

2ND CUT

SMOOTH

10"
ROUND



HELLER

American-Swiss®

SWISS PATTERN FILES

Swiss Pattern files are the delicate cutting instruments of precision craftsmen — jewelers, die-makers, gunsmiths, watchmakers and many others. Wherever it's necessary to finish delicate and intricate parts, Swiss Pattern files do the job better, quicker.

Swiss Pattern files are slender. They are narrower in both width and thickness than

other type files and the tapered files have fine points. Teeth extend to the extreme edges and much finer cuts are available than on any other files.

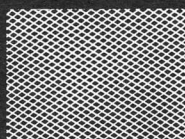
The Heller American-Swiss Swiss Pattern files are the finest available. This well-known brand has met the test of industrial users and the complete selection assures exactly the right file for any job.

COMPARISON OF CUTS

Cuts shown are those of a 6" file. On longer files cuts are coarser; on shorter files cuts are finer.



6" No. 2
84 teeth per inch



6" No. 00
34 teeth per inch



6" No. 3
102 teeth per inch



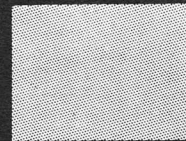
6" No. 0
50 teeth per inch



6" No. 4
120 teeth per inch



6" No. 1
66 teeth per inch



6" No. 6
184 teeth per inch

HAND FILES

SIZE	CUT	SIZE	CUT
3" x $\frac{3}{16}$ x $\frac{5}{16}$	0,2,4	8" x $\frac{23}{32}$ x $\frac{3}{16}$	00,0,1,2,3,4,6
4" x $\frac{1}{2}$ x $\frac{3}{4}$	00,0,1,2,3,4	10" x $1\frac{1}{16}$ x $\frac{3}{32}$	00,0,1,2,4
6" x $\frac{23}{32}$ x $\frac{3}{32}$	00,0,1,2,3,4,6	12" x $1\frac{1}{32}$ x $\frac{1}{4}$	00,0,2,4

PILLAR TESTING FILES

SIZE	CUT	SIZE	CUT
6" x $\frac{1}{32}$ x $\frac{3}{16}$	0,1	8" x $\frac{2}{16}$ x $\frac{1}{16}$	0,1

PILLAR FILES

SIZE	CUT	SIZE	CUT
3" x $\frac{1}{16}$ x $\frac{3}{4}$	00,0,2,3,4	8" x $\frac{23}{64}$ x $\frac{1}{16}$	00,0,1,2,3,4
4" x $\frac{23}{64}$ x $\frac{3}{4}$	00,0,1,2,3,4,6	10" x $\frac{47}{64}$ x $\frac{1}{16}$	00,0,1,2,4
6" x $\frac{1}{32}$ x $\frac{3}{4}$	00,0,1,2,3,4	12" x $\frac{53}{64}$ x $\frac{1}{16}$	00,0,1,2

NARROW PILLAR FILES

SIZE	CUT	SIZE	CUT
3" x $\frac{1}{32}$ x $\frac{3}{4}$	0,1,2,4,6	8" x $\frac{23}{64}$ x $\frac{1}{16}$	00,0,1,2,3,4
4" x $\frac{1}{32}$ x $\frac{3}{4}$	00,0,1,2,3,4,6	10" x $\frac{1}{16}$ x $\frac{1}{16}$	00,0,1,2,4
6" x $\frac{23}{64}$ x $\frac{3}{4}$	00,0,1,2,3,4,6	12" x $\frac{5}{8}$ x $\frac{3}{16}$	00,0,1,2

EXTRA NARROW PILLAR FILES

SIZE	CUT	SIZE	CUT
3" x $\frac{3}{16}$ x $\frac{3}{32}$	00,0,1,2,3,4,6	8" x $\frac{5}{16}$ x $\frac{1}{16}$	00,0,1,2,3,4
4" x $\frac{1}{16}$ x $\frac{3}{16}$	00,0,1,2,3,4,6	10" x $\frac{3}{16}$ x $\frac{1}{16}$	00,0,1,2,4
6" x $\frac{1}{4}$ x $\frac{3}{16}$	00,0,1,2,3,4,6	12" x $\frac{3}{16}$ x $\frac{1}{4}$	00,0,2

Additional Widths — Extra Narrow Pillar Files

SIZE	CUT	SIZE	CUT
6" x $\frac{1}{8}$ x $\frac{3}{16}$	00,0,2,3,4,6	6" x $\frac{3}{16}$ x $\frac{3}{16}$	00,0,2,3,4

HALF-ROUND FILES

SIZE	CUT	SIZE	CUT
3" x $\frac{3}{32}$ x $\frac{3}{32}$	00,0,1,2,3,4	6" x $\frac{23}{64}$ x $\frac{3}{16}$	00,0,1,2,3,4,6
4" x $\frac{3}{16}$ x $\frac{3}{16}$	00,0,1,2,3,4	8" x $\frac{45}{64}$ x $\frac{3}{16}$	00,0,1,2,3,4
5" x $\frac{3}{16}$ x $\frac{3}{16}$	00,0,1,2,3,4	10" x $\frac{1}{16}$ x $\frac{1}{16}$	00,0,1,2,3,4
		12" x $1\frac{1}{64}$ x $\frac{3}{16}$	00,0,2

CROSSING FILES

SIZE	CUT	SIZE	CUT
3" x $\frac{3}{16}$ x $\frac{3}{32}$	00,0,2,4	8" x $\frac{1}{16}$ x $\frac{1}{4}$	00,0,1,2,4
4" x $\frac{3}{16}$ x $\frac{1}{8}$	00,0,1,2,4	10" x $\frac{1}{32}$ x $\frac{3}{32}$	0,2
6" x $\frac{3}{16}$ x $\frac{3}{16}$	00,0,1,2,3,4,6		

KNIFE FILES

SIZE	CUT	SIZE	CUT
4" x $\frac{23}{64}$ x $\frac{3}{16}$	00,0,1,2,4	6" x $\frac{23}{32}$ x $\frac{3}{32}$	00,0,1,2,4
		8" x $\frac{23}{32}$ x $\frac{3}{16}$	00,0,1,2,4

HELLER**American-Swiss[®]****WARDING FILES**

SIZE	CUT	SIZE	CUT
3" x $\frac{1}{32}$ x $\frac{1}{32}$	00,0,2,4	8" x $\frac{2}{32}$ x $\frac{3}{32}$	00,0,2,4
4" x $\frac{1}{16}$ x $\frac{3}{64}$	00,0,2,4	10" x $\frac{1}{16}$ x $\frac{3}{64}$	00,0,2
6" x $\frac{1}{32}$ x $\frac{3}{64}$	00,0,2,4		

**EQUALLING FILES**

SIZE	CUT	SIZE	CUT
3" x $\frac{5}{16}$ x $\frac{1}{16}$	00,0,2,4	6" x $\frac{1}{32}$ x $\frac{3}{64}$	00,0,2,4
4" x $\frac{1}{32}$ x $\frac{3}{64}$	00,0,2,4	8" x $\frac{3}{4}$ x $\frac{3}{64}$	00,0,2,4

WARDING AND EQUALLING FILES MAY BE OBTAINED IN MINIMUM QUANTITIES OF ONE DOZEN IN CERTAIN B & S GAUGES.

**BARRETTE FILES**

SIZE	CUT	SIZE	CUT
3" x $\frac{1}{8}$	00,0,1,2,4	6" x $\frac{2}{32}$	00,0,1,2,4
4" x $\frac{1}{2}$	00,0,1,2,4	8" x $\frac{7}{8}$	00,0,2,4

**PIPPIN FILES**

SIZE	CUT	SIZE	CUT
4" x $\frac{5}{32}$ x $\frac{1}{8}$	00,0,2	8" x $\frac{1}{2}$ x $\frac{3}{32}$	00,0,2
6" x $\frac{1}{32}$ x $\frac{3}{32}$	00,0,2		

**CROCHET FILES**

SIZE	CUT	SIZE	CUT
3" x $\frac{1}{64}$ x $\frac{3}{64}$	00,0,2	8" x $\frac{1}{16}$ x $\frac{5}{32}$	00,0,1,2
4" x $\frac{3}{8}$ x $\frac{3}{32}$	00,0,2,4	10" x $\frac{1}{16}$ x $\frac{3}{16}$	00,0,2
6" x $\frac{3}{64}$ x $\frac{1}{8}$	00,0,1,2,4		

**SQUARE FILES**

SIZE	CUT	SIZE	CUT
3" x $\frac{1}{16}$	0,2,3,4	8" x $\frac{1}{64}$	00,0,1,2,4
4" x $\frac{3}{64}$	00,0,1,2,3,4	10" x $\frac{2}{64}$	00,0,2,4
6" x $\frac{3}{32}$	00,0,1,2,3,4		

**TAPER ROUND FILES**

SIZE	CUT	SIZE	CUT
3" x $\frac{3}{32}$	00,0,1,2,3,4,6	8" x $\frac{1}{4}$	00,0,1,2,3,4
4" x $\frac{1}{8}$	00,0,1,2,3,4,6	10" x $\frac{2}{64}$	00,0,1,2,4
5" x $\frac{5}{32}$	00,0,1,2,3,4	12" x $\frac{2}{64}$	00,0,2
6" x $\frac{3}{16}$	00,0,1,2,3,4,6		

**ROUND STRAIGHT FILES**

SIZE	CUT	SIZE	CUT
4" x $\frac{1}{8}$	00,0,2,4	8" x $\frac{1}{4}$	00,0,2,4
6" x $\frac{1}{16}$	00,0,2,4		

These special sizes also carried in stock

SIZE	CUT
4" x $\frac{1}{16}$ or $\frac{3}{32}$	00,0,2,4
6" x $\frac{1}{8}$ or $\frac{3}{32}$	00,0,2,4
8" x $\frac{1}{16}$ or $\frac{3}{8}$	00,0,2,4

**THREE SQUARE FILES**

SIZE	CUT	SIZE	CUT
3" x $\frac{3}{32}$	0,1,2,4	8" x $\frac{1}{32}$	00,0,1,2,4
4" x $\frac{1}{4}$	00,0,1,2,3,4	10" x $\frac{1}{32}$	00,0,2,4
6" x $\frac{1}{32}$	00,0,1,2,3,4		

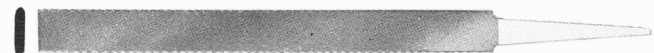
**SLITTING FILES**

SIZE	CUT	SIZE	CUT
4" x $\frac{3}{16}$	0,2	6" x $\frac{5}{8}$	0,2

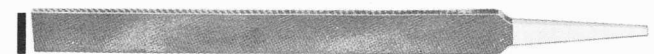
**SCREW HEAD FILES**

(With or Without Tang)

SIZE	CUT
3" x $\frac{7}{16}$ x $\frac{1}{32}$	6

**ROUND EDGE JOINT FILES**

SIZE	CUT	SIZE	CUT
4" x $\frac{1}{32}$ x $\frac{3}{64}$ (Thick)	2	4" x $\frac{1}{32}$ x $\frac{3}{64}$ (Thin)	2

**SQUARE EDGE JOINT FILES**

SIZE	CUT	SIZE	CUT
4" x $\frac{1}{32}$ x $\frac{3}{64}$ (Thick)	2	4" x $\frac{1}{32}$ x $\frac{3}{64}$ (Thin)	2

**BROACH FILES**

SIZE	CUT	TWIST DRILL GAUGE
3"	0 (Double Cut Over-all)	40-65

See Twist Drill Gauges and their Decimal Equivalents on Page 11 of Catalog #13A.

**6" HAND CORRUGATING FILES**

Also called Straight Rowing files, are designed to corrugate when stroked straight ahead. The approximate cross section dimensions are $\frac{2}{32}$ " x $\frac{5}{32}$ ".

Cuts	No. 0	No. 2	No. 4
Corrugations per inch	50	84	120

**DIE SINKERS' FILES**

Round $\frac{1}{8}$	Oval (1 Sharp Edge) $\frac{1}{32}$ x $\frac{1}{64}$	Three Square $\frac{1}{32}$	Oval $\frac{1}{32}$ x $\frac{1}{64}$	Knife $\frac{1}{32}$ x $\frac{3}{64}$ x $\frac{1}{64}$	Flat 1 Safe Edge $\frac{3}{16}$ x $\frac{3}{64}$
Auriform $\frac{1}{32}$ x $\frac{1}{64}$	Square $\frac{1}{8}$	Flat $\frac{1}{64}$ x $\frac{5}{64}$	Half Round $\frac{1}{4}$ x $\frac{3}{32}$	Crochet $\frac{3}{16}$ x $\frac{5}{64}$	Lozenge $\frac{1}{64}$ x $\frac{1}{8}$
LENGTH OVER-ALL 5 $\frac{1}{4}$ "		LENGTH OF CUT 3 $\frac{1}{2}$ "		CUTS 0,2	

**ESCAPEMENT FILES (Square Handle Needle)**













Round	Half Round	Three Square	Crossing	Knife	Flat
Square	Barrette	Equalling	Slitting	Half Round Blunt	Round Edge Joint
SIZE 5 $\frac{1}{2}$ "		CUT 0-2-4-6			

SIZE: Length, width, thickness given in inches.

SWISS PATTERN FILES













(Cut on Downward Stroke)

3 1/4" x 1/4" BENCH FILING MACHINE FILES

 PILLAR (2 SAFE EDGES) 7/32 x 1/8	 EQUALLING (CUT SIDES AND EDGES) 7/32 x 1/8	 THREE SQUARE 7/32	 CANT (CUT 3 SIDES) 15/64 x 7/64	 LOZENGE 15/64 x 1/8	 KNIFE 1/4 x 1/8
 ROUND 1/4	 HALF- ROUND 1/4 x 11/64	 OVAL 5/16 x 5/32	 PIPPIN 19/64 x 5/32	 CROCHET 1/4 x 1/8	 SQUARE 3/16
LENGTH OVER-ALL 3 1/4"	LENGTH OF CUT 2 1/4"	CUTS 00, 2	SHANK 1/4" dia.		













(Cut on Downward Stroke)

3 1/4" x 1/8" BENCH FILING MACHINE FILES

 PILLAR (2 SAFE EDGES) 13/64 x 5/64	 EQUALLING (CUT SIDES AND EDGES) 13/64 x 5/64	 THREE SQUARE 5/32	 CANT (CUT 3 SIDES) 17/64 x 3/32	 LOZENGE 7/32 x 7/64	 KNIFE 15/64 x 3/32
 ROUND 9/64	 HALF- ROUND 13/64 x 3/32	 OVAL 3/16 x 7/64	 PIPPIN 7/32 x 7/64	 CROCHET 13/64 x 5/64	 SQUARE 7/64
LENGTH OVER-ALL 3 1/4"	LENGTH OF CUT 2 1/4"	CUTS 00, 2	SHANK 1/8" dia.		













(Cut on Upward Stroke)

5" PARALLEL MACHINE FILES

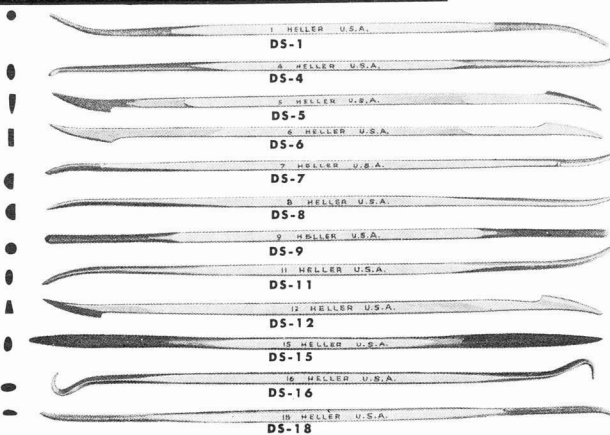
 ROUND 1/4	 HALF ROUND 17/64 x 1/8	 OVAL 1/4 x 5/32	 CANT 13/32 x 5/32	 PIPPIN 7/32 x 3/32	 KNIFE 3/8 x 3/32
 CROCHET 1/4 x 1/8	 PILLAR 1/4 x 1/8	 THREE SQUARE 11/64	 SQUARE 1/4	 LOZENGE 9/32 x 5/32	 EQUALLING 1/4 x 1/8
LENGTH OVER-ALL 7"	LENGTH OF CUT 5"	CUTS 00, 2			

(Cut on Downward Stroke)

8" PARALLEL MACHINE FILES

 ROUND 1/4"	 SQUARE 3/16"	 PILLAR (1 SAFE EDGE) 3/16" x 3/32"	 CROCHET 3/16" x 3/32"	 THREE SQUARE 3/16"	 HALF ROUND 3/16" x 3/32"
 OVAL 11/32" x 3/16"	 KNIFE 15/32" x 1/8"	 PIPPIN 19/64" x 5/32"	 EQUALLING (CUT SIDES AND EDGES) 3/8" x 5/64"	 LOZENGE (CUT 3 SIDES) 11/32" x 7/32"	 CANT 11/32" x 5/32"
LENGTH OF CUT 6"	LENGTH OVER-ALL 8"	CUTS 00, 2			

die sinkers' rifflers

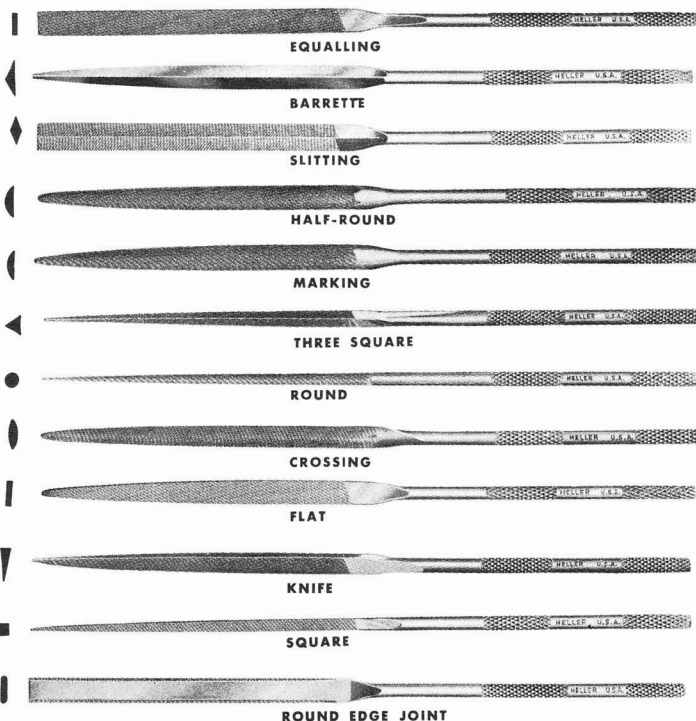


SIZE
6 1/2"

CUT
0, 2, 4

regular needle files

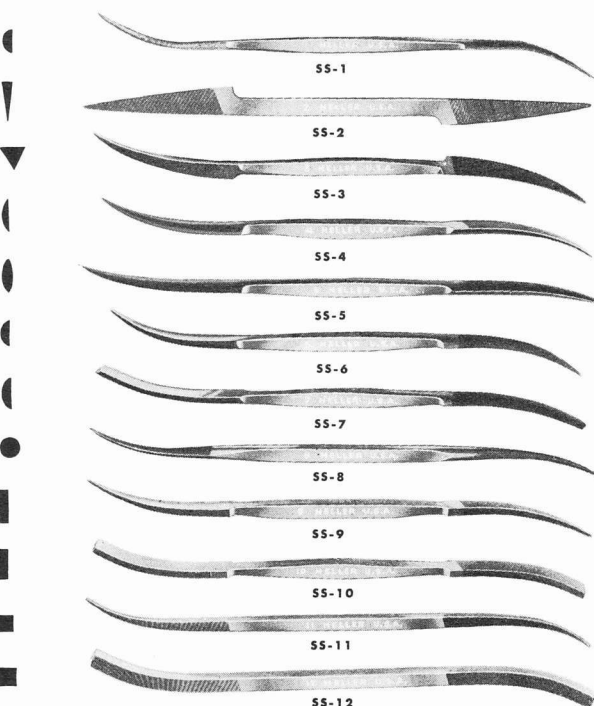
Round Knurled Handles



SIZE	CUT
4"	0, 2, 4, 6
5 1/2"	0, 2, 4, 6
6 1/4"	0, 2, 4, 6

Sets of 12 assorted shapes
available in handy plastic
kit.

silversmiths' rifflers

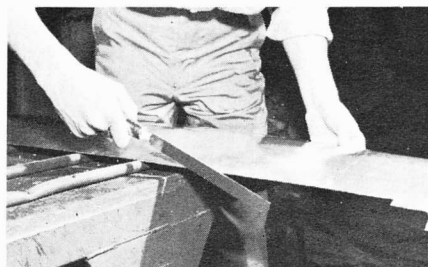


SIZE
7 1/2"

CUT
0, 2

VIXEN®

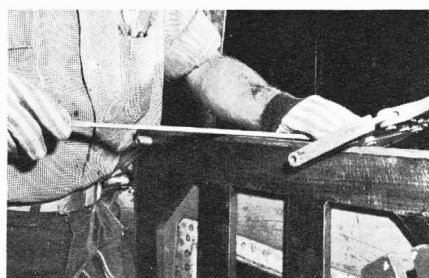
— the original and still the best milled curved-tooth file



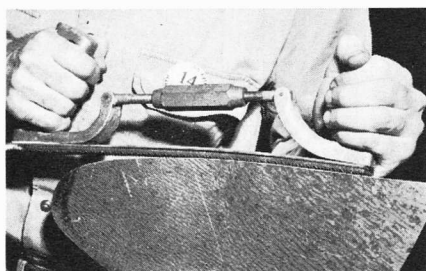
Finishing aluminum to ten-thousandths accuracy by hand dressing with a VIXEN rigid tanged file after mechanical cutting and forming.



Here the VIXEN rigid tanged file is used on plastic because close tolerances are necessary. Equally good results are obtained on Fiberglas.



On stainless steel, the VIXEN rigid tanged file is used where accuracy must be within one ten-thousandth.

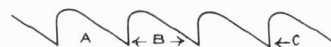


The flexible VIXEN is used on curved surfaces in automotive and aviation plants where smooth finishes are required.

cuts freer, more rapid and produces a smoother finish

The VIXEN is an entirely new and revolutionary development in files. Designed originally to salvage hard castings, it has since been frequently improved by Heller and now is used in almost every type of work. Following are its exclusive features:

1. deep gullets and wide pitch give maximum clearing action



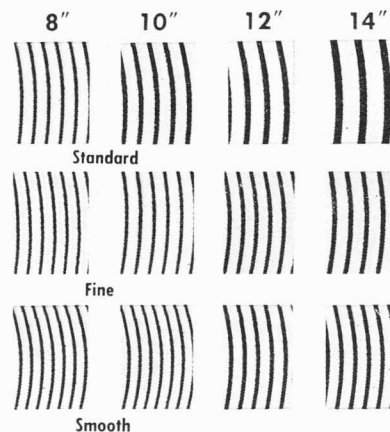
The deep, wide gullets of the VIXEN, shown here, (A), and the widely spaced teeth, (B), enable the filings to curl and drop free—producing a smooth, even finish.

2. undercut gives VIXEN teeth milling cutter action

The unique VIXEN teeth have an undercut or forward slant, (C), which gives a positive cutting action—like actual milling cutters. All teeth are of uniform height and shape — all clearances are held to extremely close tolerances.

3. resharpener for economy

The VIXEN can be resharpener many times—many VIXENS have had as many as ten resharpenings. Heller's development of the automatic sharpening machine is a major advance in file history.



TEETH PER INCH

FLAT, FLEXIBLE, HALF ROUND SOLID, HALF ROUND SHELLS, MOLDING

Size	Std.	Fine	Smooth
8 inch	14	16	18
10 inch	12	14	16
12 inch	10	12	14
14 inch	8	10	12

PILLAR AND SQUARE

Size	Std.
8 inch	18
10 inch	16
12 inch	14

BABBITT

8 inch	10
10 inch	10
12 inch	8
14 inch	7

FLAT UTILITY

Size	Coarse Side	Smooth Side
8 inch	14	18
10 inch	12	16
12 inch	10	14
14 inch	8	12

The VIXEN is made in various cuts, the names of which apply only to the VIXEN. Above is a chart of these cuts; at left, is listed the number of teeth per inch.

a different and exclusive type of steel

VIXEN'S keen teeth and flexibility demand a very special type of alloy steel. This steel was once imported from Sweden. Now an even superior American chrome alloy steel is used — exclusively made for VIXEN.

rigid tang types



VIXEN FLAT FILES WITH TANG

SIZE		CUT		
8" x $1\frac{1}{16}$ " x $1\frac{1}{64}$ "	ST	F	S	
10" x 1" x $\frac{7}{32}$ "	ST	F	S	
12" x $1\frac{5}{32}$ " x $\frac{1}{16}$ "	ST	F	S	
14" x $1\frac{11}{32}$ " x $\frac{3}{16}$ "	ST	F	S	



VIXEN BABBITT FILES WITH TANG

SIZE		CUT	
8" x $1\frac{1}{16}$ " x $1\frac{1}{64}$ "	Coarser than Standard		
10" x 1" x $\frac{7}{32}$ "	Coarser than Standard		
12" x $1\frac{5}{32}$ " x $\frac{1}{16}$ "	Coarser than Standard		
14" x $1\frac{11}{32}$ " x $\frac{3}{16}$ "	Coarser than Standard		



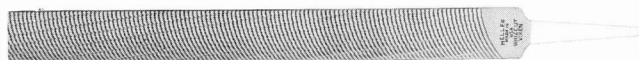
VIXEN FLAT UTILITY FILES WITH TANG

SIZE		CUT	
8" x $1\frac{1}{16}$ " x $1\frac{1}{64}$ "	One side ST, one side S		
10" x 1" x $\frac{7}{32}$ "	One side ST, one side S		
12" x $1\frac{5}{32}$ " x $\frac{1}{16}$ "	One side ST, one side S		
14" x $1\frac{11}{32}$ " x $\frac{3}{16}$ "	One side ST, one side S		



VIXEN HALF ROUND FILES WITH TANG

SIZE		CUT	
8" x $2\frac{3}{32}$ " x $\frac{1}{4}$ "	ST	F	
10" x $1\frac{1}{16}$ " x $\frac{3}{16}$ "	ST	F	
12" x $1\frac{1}{8}$ " x $\frac{3}{16}$ "	ST	F	
14" x $1\frac{1}{2}$ " x $\frac{7}{16}$ "	ST	F	



vixen whizcut

SIZE		CUT	
8" x $1\frac{1}{16}$ " x $1\frac{1}{64}$ "	ST	F	S
10" x 1" x $\frac{7}{32}$ "	ST	F	S
12" x $1\frac{5}{32}$ " x $\frac{1}{16}$ "	ST	F	S
14" x $1\frac{11}{32}$ " x $\frac{3}{16}$ "	ST	F	S



VIXEN PILLAR FILES

SIZE		CUT	
8" x $1\frac{1}{32}$ " x $\frac{1}{4}$ "	ST		
10" x $2\frac{1}{32}$ " x $\frac{1}{16}$ "	ST		
12" x $2\frac{1}{32}$ " x $\frac{3}{64}$ "	ST		



VIXEN SQUARE FILES

SIZE		CUT	
8" x $1\frac{1}{64}$ "	ST		
10" x $1\frac{1}{32}$ "	ST		
12" x $1\frac{1}{32}$ "	ST		

wood holders



HOLDER V-1



HOLDER V-3

plain type blades



VIXEN FLEXIBLE FILES

SIZE		CUT	
8" x $2\frac{5}{32}$ " x $\frac{5}{32}$ "	ST	F	
10" x 1" x $\frac{5}{32}$ "	ST	F	S
12" x $1\frac{5}{32}$ " x $\frac{3}{16}$ "	ST	F	S
14" x $1\frac{11}{32}$ " x $\frac{3}{16}$ "	ST	F	S



VIXEN HALF ROUND SHELL FILES

SIZE		CUT	
8" x $\frac{7}{8}$ " x $\frac{1}{8}$ "	ST		
10" x $1\frac{1}{8}$ " x $\frac{1}{8}$ "	ST		
12" x $1\frac{1}{4}$ " x $\frac{1}{8}$ "	ST		
14" x $1\frac{1}{2}$ " x $\frac{1}{8}$ "	ST	F	



VIXEN HALF OVAL SHELL FILES

SIZE		CUT	
14" x $1\frac{1}{32}$ " x $\frac{3}{64}$ "	ST		



VIXEN NARROW FLEXIBLE FILE

SIZE		CUT	
14" x $\frac{5}{8}$ "	ST		
14" x $\frac{3}{4}$ "	ST		
14" x 1"	ST		



VIXEN MOLDING FILES

SIZE		CUT	
8" x $\frac{7}{8}$ " x $\frac{1}{8}$ "	ST		
10" x $1\frac{1}{8}$ " x $\frac{1}{8}$ "	ST		
12" x $1\frac{1}{4}$ " x $\frac{1}{8}$ "	ST		
14" x $1\frac{1}{2}$ " x $\frac{1}{8}$ "	ST		

SPECIAL SEALED PACKAGE

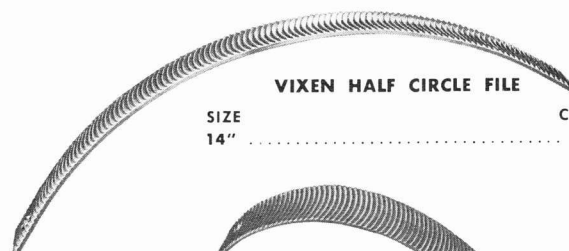
Vixen 14-inch Flexible, 14" Half Round Shell and 14" Molding files are sealed with a rivet in individual envelopes at the factory for buyers' protection against imitation, inferior and resharpened files.



HELLER VIXEN

MILLED CURVED TOOTH FILE

Manufactured and Sold by HELLER TOOL CO. Newburgh, N.Y.



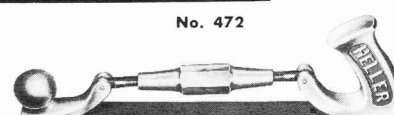
VIXEN HALF CIRCLE FILE

SIZE		CUT	
14"	ST		

SPECIAL CURVED VIXEN FILE

SIZE		CUT	
14"	ST		

metal holder



No. 472

HELLER

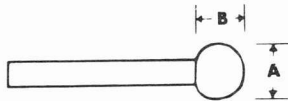
ROTARY FILES

HAND-CUT

GROUND-FROM-SOLID

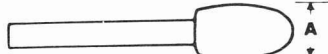
Special analysis, high quality steel, plus precision manufacture make each HELLER Rotary File last longer — and cut faster. HELLER'S Regrinding Service restores them to service at a fraction

of their original cost — thereby extending their useful life and saving you money. Available in a full range of shapes and sizes, HELLER'S complete line includes Handcut, Ground-from-Solid and Miniatures.



BALL SHAPE HIGH-SPEED STEEL

HAND CUT	GROUND from solid	A	B	HAND CUT	GROUND from solid	A	B
H12	HG12	1/8"	1/8"	H16	HG16	1/2"	1/2"
H13	HG13	3/16"	3/16"	H17	HG17	5/8"	5/8"
H14	HG14	1/4"	1/4"	H18	HG18	3/4"	3/4"
H88	HG88	3/8"	3/8"	H19	HG19	1"	1"
H15	HG15	3/8"	3/8"				



OVAL SHAPE HIGH-SPEED STEEL

HAND CUT	GROUND from solid	A	B	HAND CUT	GROUND from solid	A	B
H34	HG34	3/16"	3/16"	H37	HG37	1/2"	7/8"
H35	HG35	1/4"	1/2"	H38	HG38	5/8"	1"
H87	HG87	3/8"	5/8"	H39	HG39	3/4"	1 1/8"
H36	HG36	3/16"	2 1/2"	H40	HG40	1"	1 3/8"



TREE SHAPE (pointed end) HIGH-SPEED STEEL

HAND CUT	GROUND from solid	A	B	HAND CUT	GROUND from solid	A	B
H4	HG4	1/4"	3/4"	H7	HG7	1/2"	1 1/8"
H5	HG5	3/8"	3/4"	H8	HG8	5/8"	1"
H6	HG6	1/2"	3/4"	H9	HG9	1 1/8"	2"



TREE SHAPE (radius end) HIGH-SPEED STEEL

HAND CUT	GROUND from solid	A	B	HAND CUT	GROUND from solid	A	B
H28	HG28	1/4"	3/4"	H31	HG31	1/2"	1 1/8"
H29	HG29	1/4"	1 1/2"	H32	HG32	3/4"	1 1/4"
H30	HG30	3/8"	3/4"	H33	HG33	1 1/8"	2"



CONE SHAPE (60° and 90°) HIGH-SPEED STEEL

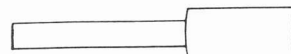
HAND CUT	GROUND from solid	A	B	HAND CUT	GROUND from solid	A	B
H20	HG20	1/2"	90°	H24	HG24	1/2"	60°
H21	HG21	5/8"	90°	H25	HG25	5/8"	60°
H22	HG22	3/4"	90°	H26	HG26	3/4"	60°
H23*	HG23*	1"	90°				

*H-23 and HG-23 also available in 1 1/4", 1 3/8", 2" and 2 1/2" diameter made without point. 1 1/4" and 1 3/8" diameter have 3/8" shank, 2" diameter has 1/2" shank, 2 1/2" diameter has 3/4" shank.



CONE SHAPE (other) HIGH-SPEED STEEL

HAND CUT	GROUND from solid	A	B	HAND CUT	GROUND from solid	A	B
H27	HG27	1"	1 3/8"	H46	HG46	1/4"	1 1/8"
H41	HG41	1/4"	1/2"	H47	HG47	3/8"	5/8"
H42	HG42	1/4"	3/4"	H48	HG48	1/2"	7/8"
H43	HG43	1/4"	1"	H49	HG49	5/8"	1"
H44	HG44	3/8"	3/4"				
H45	HG45	3/8"	1"				

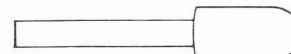


CYLINDRICAL SHAPE (flat end) HIGH-SPEED STEEL

HAND CUT	GROUND from solid	A	B	HAND CUT	GROUND from solid	A	B
H50†	HG50	1/8"	1/2"	H56	HG56	5/8"	1 1/2"
H51	HG51	1/4"	1"	H57	HG57	3/8"	1 1/2"
H52	HG52	1/4"	1 1/2"	H58	HG58	1/2"	1 1/2"
H53	HG53	3/8"	1"	H93	HG93	5/8"	1"
H54	HG54	1/2"	1"	H94	HG94	3/4"	1 1/2"
H55	HG55	3/4"	3/4"	H95	HG95	1"	1"

†(Not End Cut)

Hand Cut — Cut End unless otherwise specified.
Ground-from-Solid — Plain End unless otherwise specified.



CYLINDRICAL SHAPE (ball nose) HIGH-SPEED STEEL

HAND CUT	GROUND from solid	A	B	HAND CUT	GROUND from solid	A	B
H59	HG59	1/8"	1/2"	H64	HG64	1/2"	1"
H60	HG60	1/4"	1"	H65	HG65	5/8"	1"
H61	HG61	1/4"	1 1/2"	H66	HG66	3/4"	1 1/4"
H62	HG62	3/8"	1"	H67	HG67	5/8"	1 1/2"
H63	HG63	3/8"	1 1/2"	H68	HG68	1/2"	1 1/2"



TAPERED SHAPE (radius end) HIGH-SPEED STEEL

HAND CUT	GROUND from solid	A	B	HAND CUT	GROUND from solid	A	B
H69	HG69	5/16"	3/8"	H71	HG71	3/8"	1 3/4"
H70	HG70	5/16"	1 1/4"	H72	HG72	5/8"	1"



FLAME SHAPE HIGH-SPEED STEEL

HAND CUT	GROUND from solid	A	B	H2	HG2	5/8"	1 1/8"
H1	HG1	5/8"	7/8"	H3	HG3	3/4"	1 1/4"



CYLINDRICAL SHAPE (double tapered) HIGH-SPEED STEEL *

HAND CUT	GROUND from solid	A	B
H73	HG73	1 1/8"	3/8"

BI-SHAPE HIGH-SPEED STEEL *



HAND CUT	GROUND from solid	A	B
H10	HG10	1/4"	1"
H11	HG11	5/16"	1 1/8"
H97	HG97	3/8"	1 1/8"

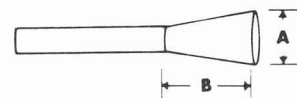


BARREL SHAPE HIGH-SPEED STEEL *

HAND CUT	GROUND from solid	A	B
H89	HG89	1/2"	1"

*THESE FILES MADE IN CARBIDE ON SPECIAL ORDER ONLY

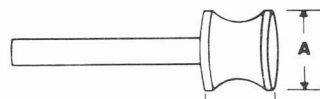
ROTARY FILES - cont'd



**INVERTED CONE SHAPE
HIGH-SPEED STEEL***

HAND CUT	GROUND from solid	A	B
H74	HG74	3/4"	5/8"

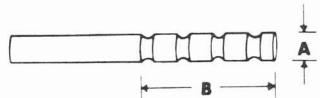
HAND CUT	GROUND from solid	A	B
H96	HG96	1/2"	3/4"



**CONCAVE SHAPE—Type 1
HIGH-SPEED STEEL ***

HAND CUT	GROUND from solid	A	B
H75	HG75	3/4"	1/2"
H90	HG90	1"	7/32"

HAND CUT	GROUND from solid	A	B
H91	HG91	1 1/4"	3/32"



**CONCAVE SHAPE—Type 2
HIGH-SPEED STEEL ***

Furnished with cut end unless otherwise specified.

HAND CUT	GROUND from solid	A	B
H92	HG92	1/4"	1 1/16"

*THESE FILES MADE IN CARBIDE ON SPECIAL ORDER ONLY

RECOMMENDED OPERATING SPEEDS OF HIGH-SPEED STEEL ROTARY FILES FOR VARIOUS MATERIALS:

Revolutions per Minute for Various File Diameters

	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
Steel	4,000	2,500	2,000	1,500	1,350	1,200	800
Cast Iron	6,000	3,400	2,250	1,750	1,450	1,250	1,000
Aluminum	15,000	10,000	8,000	6,000	5,000	4,000	2,500
Brass							
Bronze							
Magnesium	8000	7000	6500	6000	5000	4500	4000

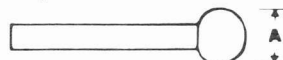
RECOMMENDED OPERATING SPEEDS OF CARBIDE BURRS OF VARIOUS DIAMETERS:

Dia.	R.P.M.	Dia.	R.P.M.	Dia.	R.P.M.	Dia.	R.P.M.
1/8"	22,000	3/8"	13,000	5/8"	11,000	7/8"	10,000
1/4"	15,000	1/2"	12,000	3/4"	11,000	1"	10,000

When used on stainless steel above speeds should be increased approximately 60%.

HELLER CARBIDE BURRS

All Burrs are furnished with 15/8" x 1/4" brazed shanks; all are available from stock in standard (medium) cuts. Fine, coarse and diamond cuts on request.



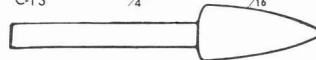
BALL SHAPE

	A	B
C-10	3/8"	5/8"
C-11	1/2"	3/4"
C-12	5/8"	1"
C-13	3/4"	1 1/8"



OVAL SHAPE

	A	B
C-50	3/8"	5/8"
C-51	1/2"	3/4"
C-52	5/8"	1"



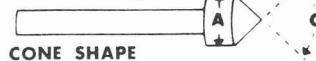
**TREE SHAPE
(pointed end)**

	A	B
C-40	3/8"	3/4"
C-41	1/2"	3/4"
C-42	1/2"	1"
SG-6	5/8"	1"



**TREE SHAPE
(radius end)**

	A	B
C-30	3/8"	3/4"
C-31	1/2"	1"
C-32	5/8"	1"



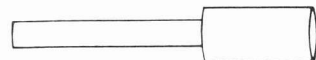
**CONE SHAPE
(60° and 90°)**

	A	C
C-60	3/8"	60°
C-61	1/2"	60°
C-62	5/8"	60°
C-90	3/8"	90°
C-91	1/2"	90°
C-92	5/8"	90°



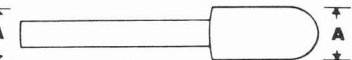
**CONE SHAPE
(other)**

	A	B	C
SM-4	3/8"	5/8"	28°
SM-5	1/2"	3/4"	28°
SM-6	5/8"	1"	31°



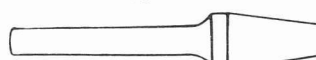
**CYLINDRICAL
(flat end)**

	A	B
C-1	3/8"	3/4"
C-2	1/2"	1"
C-3	5/8"	1"



**CYLINDRICAL
(ball nose)**

	A	B
C-20	3/8"	3/4"
C-21	1/2"	1"
C-22	5/8"	1"



**TAPERED SHAPE
(14° included angle)**

	A	B
C-121	3/8"	7/8"
C-122	3/8"	1 1/8"
C-123	1/2"	1 1/8"
C-124	5/8"	1 3/8"
C-125	3/4"	1 1/2"



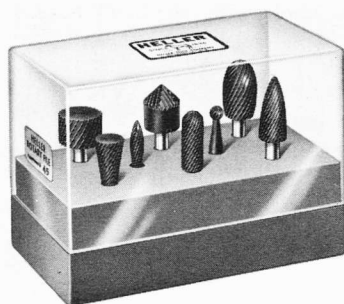
**FLAME SHAPE
(radius end)**

	A	B
C-131	1/2"	1 1/4"
C-132	3/8"	1 3/8"
C-133	3/4"	1 5/8"

HELLER SOLID CARBIDE BURRS

SET No. 1			SET No. 2			SET No. 3			SET No. 4			SET No. 5		
1/8" Diameter Heads 1/8" Diameter Shanks 1 1/2" Overall Length			1/4" Diameter Heads 1/4" Diameter Shanks 2" Overall Length			1/4" Diameter Heads 1/8" Diameter Shanks 1 1/4" Shank Length 1 3/4" Max. OAL.			1/4" Diameter Heads 3/16" Diameter Shanks 1 1/4" Shank Length 1 3/4" Max. OAL.			3/16" Diameter Heads 3/16" Diameter Shanks 2" Overall Length		
Tool No.	S.C.T.I.* No.	Head Length	Tool No.	S.C.T.I.* No.	Head Length	Tool No.*	Head Length		Tool No.*	Head Length		Tool No.*	Head Length	
101-A	SA-43	9/16"	101-C	SA-1	5/8"	SA-51	1/2"		SA-91	1/2"		SA-81	5/8"	
102-A	SD-42	1"	102-C	SD-1	1 1/4"	SB-51	3/16"		SB-91	3/16"		SD-81	3/16"	
103-A	SC-42	9/16"	103-C	SC-1	5/8"	SC-51	1/2"		SC-91	1/2"		SC-81	5/8"	
104-A	SF-42	1 1/2"	104-C	SF-1	5/8"	SD-51	1 1/4"		SD-91	1 1/4"		SF-81	1 1/2"	
105-A	SG-44	1 1/2"	105-C	SG-1	5/8"	SE-51	3/8"		SE-91	3/8"		SG-81	1 1/2"	
106-A	SL-42	1 1/2" — 8°	106-C	SL-1	5/8" — 14°	SF-51	1 1/2"		SF-91	1 1/2"		SM-81	5/8" — 14°	
107-A	SE-41	7/32"	107-C	SE-1	3/8"	SG-51	1 1/2"		SG-91	1 1/2"		SE-81	9/32"	
108-A	SN-42	3/16" — 10°	108-C	SN-1	5/16" — 10°	SM-51	1 1/2" — 22°		SM-91	1 1/2" — 22°		SN-81	1 1/4" — 10°	
109-A	SJ-42	60°	109-C	SJ-1	60°	SN-51	1 1/4" — 10°		SN-91	1 1/4" — 10°		SJ-81	60°	
110-A	SK-42	90°	110-C	SK-1	90°							SK-81	90°	

* Solid Carbide Tool Institute Identification



POPULAR ASSORTMENTS OF HELLER ROTARY FILES

ASSORTMENT NO. 35 Hand Cut	ASSORTMENT NO. 55 Ground- From-Solid	ASSORTMENT NO. 25 Hand Cut	ASSORTMENT NO. 45 Ground- From-Solid	ASSORTMENT NO. 65 Miniature Ground-From-Solid	ASSORTMENT NO. 75 Miniature Ground-From-Solid
H- 7-M	HG- 7-M	H- 7-M	HG- 7-M	MG- 4	MG- 3
H-14-M	HG-14-M	H-10-M	HG-10-M	MG- 6	MG- 4
H-21-M	HG-21-M	H-14-M	HG-14-M	MG-10	MG- 5
H-38-M	HG-38-M	H-21-M	HG-21-M	MG-14	MG- 6
H-62-M	HG-62-M	H-38-M	HG-38-M	MG-18	MG-10
H-94-M	HG-94-M	H-62-M	HG-62-M	MG-20	MG-14
		H-94-M	HG-94-M	MG-21	MG-18
		H-96-M	HG-96-M	MG-23	MG-20
					MG-21
					MG-23

HELLER

PRECISION CARBIDE TOOLS

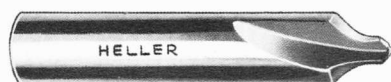
Heller carbide machine tools are precision ground from solid carbide and are of the highest quality throughout. Carbide tools pay for themselves many times over by their exceedingly long life and by the high quality work they turn out. For Heller's complete line of Carbide Tools, write for catalog CT 4. Special carbide tools can be furnished upon request.

SOLID CARBIDE END MILLS



Ground from solid carbide in a large variety of styles and sizes from 1/16" through 3/4" diameter. For machining stainless steels, alloys and hardened steels of Rockwell C-60 and higher.

PILOTED COUNTERSINKS



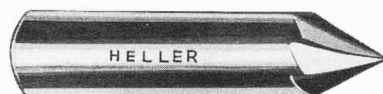
These countersinks are made in 1/4" to 1/2" cutter diameters; 3/32" to 5/16" pilot diameters. Radius can be supplied from .015 to .125; cutting angle from 60 to 140 degrees. Overall length is 2" for all sizes.

COMBINED CENTER DRILLS AND COUNTERSINKS



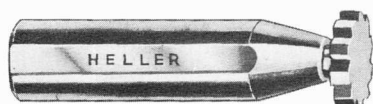
This is a single flute, form relieved, center drill and countersink furnished in six sizes, double end.

CENTER LAPS



Carbide center laps are used for lapping centers in metal parts after hardening of the steel.

KEYSEAT CUTTERS

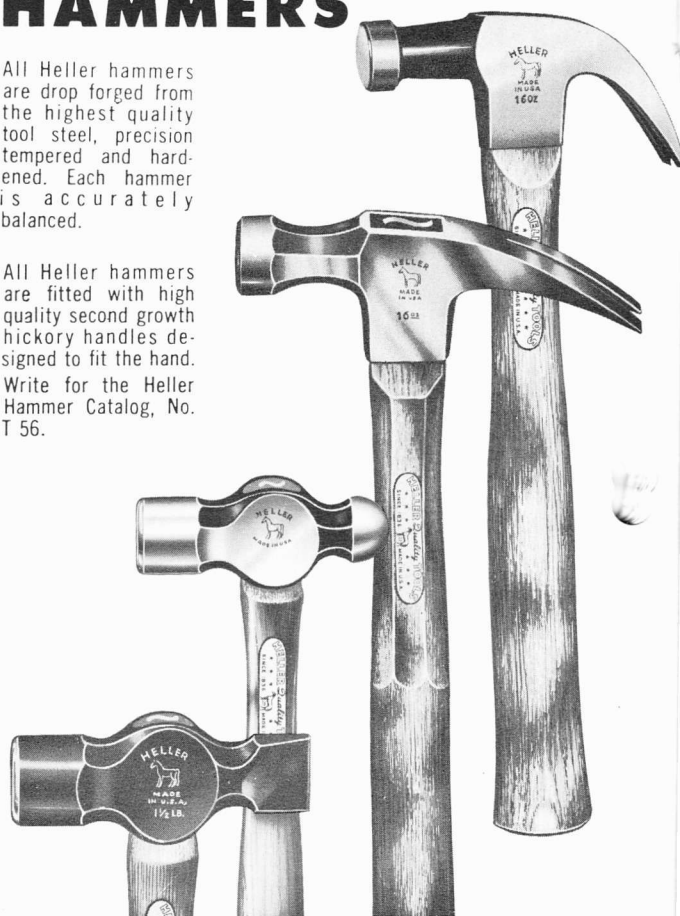


Have solid carbide heads for slotting work on metals of approximately Rockwell C-60 hardness. Made with straight flutes and produce an exceptionally fine finish.

HELLER HAMMERS

All Heller hammers are drop forged from the highest quality tool steel, precision tempered and hardened. Each hammer is accurately balanced.

All Heller hammers are fitted with high quality second growth hickory handles designed to fit the hand. Write for the Heller Hammer Catalog, No. T 56.



INTERNAL GRINDING BURRS



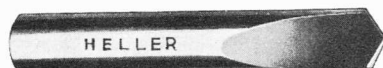
Used to take the place of mounted points and internal grinding wheels.

Used on hardened metal dies, bushings, soft metal parts, etc.

Special angles or radii, and double ends can be furnished.

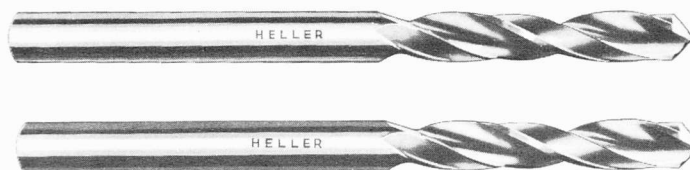
No.	HEAD DIA.	SHANK DIA.	OAL
70-X	1/16	1/8	1-1/2
70-Y	3/32	1/8	1-1/2
70-A	1/8	1/8	1-1/2
70-BB	5/32	3/16	2
70-B	3/16	3/16	2
70-CC	7/32	1/4	2
70-C	1/4	1/4	2
70-D	5/16	1/4	2-1/2
70-E	3/8	1/4	2-1/2
70-F	7/16	1/4	2-1/2
70-G	1/2	1/4	2-1/2

FLAT DRILLS



Designed for drilling hardened steel up to Rockwell C 65-66 hardness. Also adaptable for drilling glass. Instructions pertaining to standard drills should be followed.

SOLID CARBIDE DRILLS



These drills are available in three series: Fractional Size (1101 Series, 1/16" to 1/2" diameter), Letter Size (1102 series, A-.234 through Z-.413 diameters) and Wire Gauge Number Size (1103 series, wire gauge no. 1-.2280 through no. 60-.0400 diameters). All are straight shank, right hand spiral for right hand cutting.

Solid carbide drills are recommended for hardened steels of a Rockwell C-60 hardness and over. Extra caution must be taken in using solid carbide drills in soft steels.

Recommended coolants are: light oil, soluble oil, Kerosene, and on some materials, air blast.

SOLID CARBIDE CHUCKING REAMERS

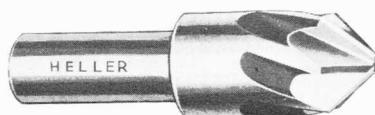


These reamers are ideal for reaming steels hardened to Rockwell C-63. Also for stainless steels, aluminum, brass, bronze, etc.

The number of flutes will range from four on the small sizes to five or seven on the large sizes. Available in straight, right or left hand spiral flutes.

Coolants are not necessary on many types of metals but soluble oil or kerosene is advised for good, clean holes. Use hand feed when working hardened metals. Use bushings whenever possible. Standard reamers are furnished with a radial rake.

CHATTERLESS COUNTERSINKS



Available in stock in 60, 82 and 90 degree included angles. Other angles available upon request. Heller chatterless counter sinks are of the highest quality — engineered for fast shearing cuts.

OTHER HELLER TOOLS

Heller also manufactures a quality line of Blacksmiths' Tools, Farriers' Tools and Scrapers. Each of these tools are made of the best steel and meets the high standards of Heller quality.

HELLER

"Job Tempered"

HACKSAW BLADES

You can depend on Heller "Job Tempered Blades" to lower your cutting costs. Heller puts its 120 years of experience as a manufacturer of fine cutting tools behind the manufacture of every blade. This Heller promise of satisfaction with its assurance of superior cutting is based on three facts:

1. BLADES ARE "JOB TEMPERED":

Cross rolled steel produced to Heller's exacting metallurgical specifications has the toughness and grain structure required for superior cutting. Unique heat treating methods matched to the metallurgical analysis give each blade *uniform temper* over its full length. This modern combination of job-mated steel and uniform tempering assures the utmost in satisfaction.

2. TEETH ARE UNIFORM:

Accurate machining gives teeth the shape, spacing and height that distributes wear evenly and lengthens cutting life.

3. SET IS UNIFORM:

Teeth are set to extremely close tolerances by America's most modern specialized machines. So, proper clearance and straight cutting are built into every blade. "WHEN THE END IS WHITE THE BLADE IS RIGHT" . . . unmistakable proof that the saw is a Heller "Job Tempered" Blade built for fast, straight cutting and long service life.

Heller
Quality

Heller nuent

"Job Tempered"

HIGH SPEED "M"-HAX BLADE

**for General Purpose Cutting
... at Lowest Cost**

Heller High Speed "M"-HAX Blades deliver fast, straight cuts on a wide variety of steels. When machines are in good condition, you can depend on these blades for the long life that keeps costs low.

HIGH SPEED "T"-HAX BLADE

**for Cutting Tough
High-Alloy Steels**

Heller High Speed "T"-HAX Blades are first choice for cutting stainless and other high alloy steels. Their high heat resistance helps them stand up when the going is rough.

NUWELD SHATTER- PROOF BLADE

**for Maximum Safety
Under All Conditions**

Heller "NUWELD" Blades will not shatter in operation no matter how rough the use or how old the machine. The combination of a High Speed Steel cutting edge electrically welded to an extra tough alloy steel body prevents breakage . . . You can safely use these shatter-proof blades for all types of cutting.

HOW TO GET THE MOST OUT OF POWER BLADES

CHECK YOUR MACHINE! If it isn't lifting the blade slightly on the return stroke, blade life will be shortened.

TEST SPEEDS AND FEEDS! Slow speed and heavy feed make blades last longer. When speeds are too fast and feeds too light, blades slide over the work and dull themselves too soon. Actual tests will show you the best feed and speed for the specific jobs at hand. Use the following chart as the basis for tests.

Machine	With or Without Solution	Unannealed Tool Steel & Hard Metals Strokes Per Minute	Annealed Tool Steel Strokes Per Minute	Machinery Steel and Soft Metal Strokes Per Minute
Light	Without	40	50-60	50-60
Medium	Without	40	50-60	50-60
Medium	With	60	65-90	100-110
Heavy	With	60	90	110-120
Ex. Heavy	With	60	90	110-120

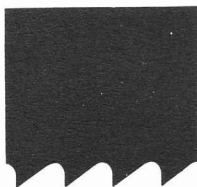
Except when cutting cast iron, plenty of cutting compound should be used. This acts as a cooling medium and also reduces friction to a minimum.

Power Hack Saw Blades

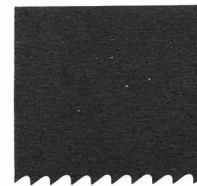


SELECT THE CORRECT TOOTH SPACING

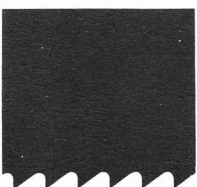
3T AND 4T BLADES are best for cutting 4" or larger sections of the softer ferrous metals, most alloy steels and non-ferrous metals. Large gullet capacity handles heavy chips, prevents clogging, speeds cutting and lengthens blade life.



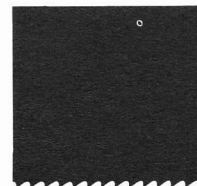
10T BLADES are used for cutting very hard materials and sections up to 2" thick. They're better suited for general-purpose cutting in the machine shop than for production cutting. For the latter, 4-6 tooth blades are preferable.



6T BLADES are recommended for cutting 2" to 4" sections of bars and hard materials. They last longer than blades with coarser tooth spacing for these applications. More teeth per inch spread wear over more cutting points.



14T BLADES should be used for cutting such thin sections as pipe, tubing, small bars and light angle iron. Since these blades are only .032" and .050" thick, their use should be confined to light machines cutting small sections.



POWER BLADE SPECIFICATIONS PACKED 10 BLADES IN A BOX

ORDER BY PART NUMBER		HIGH SPEED "M"-HAX			HIGH SPEED "T"-HAX			"NUWELD" High Speed		
Length and Width	Thickness	No. Teeth per Inch and Part No.		Lbs. per 100	No. Teeth per Inch and Part No.		Lbs. per 100	No. Teeth per Inch and Part No.		Lbs. per 100
12"x	5/8"	14	18	7.5	14	18	8	14	18	8
		33-1214-3	33-1218-3		34-1214-3	34-1218-3		35-1214-3	35-1218-3	
	1	10	14	19	10	14	20	10	14	20
		33-1210-5	33-1214-5		34-1210-5	34-1214-5		35-1210-5	35-1214-5	
	1	10	14	21	10	14	23	10	14	23
		33-1410-5	33-1414-5		34-1410-5	34-1414-5		35-1410-5	35-1414-5	
14"x	1 1/4	6	10	32	6	10	35	6	10	35
		33-1406-6	33-1410-6		34-1406-6	34-1410-6		35-1406-6	35-1410-6	
	1 1/2	3	4	46	3*	4	50	3	4	51
		33-1403-7	33-1404-7		34-1403-7	34-1404-7		35-1403-7	35-1404-7	
	1	10	14	25	10	14	27	10	14	28
		33-1710-5	33-1714-5		34-1710-5	34-1714-5		35-1710-5	35-1714-5	
17"x	1 1/4	3	4	39	4	6	42	4	6	43
		33-1703-6	33-1704-6		34-1704-6	34-1706-6		35-1704-6	35-1706-6	
		6	10		10			10		
		33-1706-6	33-1710-6		34-1710-6			35-1710-6		
	1 1/4	6	10	40	6	10	44	6	10	45
		33-1806-6	33-1810-6		34-1806-6	34-1810-6		35-1806-6	35-1810-6	
18"x	1 1/2	4	6	59	3	4	64	3	4	64
		33-1804-7	33-1806-7		34-1803-7	34-1804-7		35-1803-7	35-1804-7	
	1 3/4	3	4	84	3*	4	90	3	4	88
		33-1803-8	33-1804-8		34-1803-8	34-1804-8		35-1803-8	35-1804-8	
21"x	1 3/4	3	4	95	3†	4	103	4	6	104
		33-2103-8	33-2104-8		34-2103-8	34-2104-8		35-2104-8	35-2106-8	
		6			6			6		
		33-2403-8	33-2404-8		34-2403-8	34-2404-8		35-2403-8	35-2404-8	
24"x	1 3/4	3	4	111	3†	4	119	3	4	125
		33-2403-8	33-2404-8		34-2403-8	34-2404-8		35-2403-8	35-2404-8	
		6			6			6		
		33-2403-0	33-2404-0		34-2403-0	34-2404-0		35-2403-0	35-2404-0	
	2	3	4	142	3*	4	152	3	4	149
		33-2403-0	33-2404-0		34-2403-0	34-2404-0		35-2403-0	35-2404-0	
30"x	2 1/2	4		229	4		244	4		231
		33-3004-0			34-3004-0			35-3004-0		
36"x	4 1/2				2 1/2		654	2 1/2		648
					34-3625-2			35-3625-2		

This list comprises all types, sizes, and tooth spacings that will be regularly carried in stock. Anything differing from these Hack Saws will be considered as special and will not be manufactured except in cases of urgent necessity.

*Also furnished Every Tooth Set designed for cutting High Chrome Nickel Alloy Steel. Be sure to specify when ordering.

†Furnished Every Tooth Set only for cutting High Chrome Nickel Alloy Steel.

Heller

"Job Tempered"

Hand Hack

"HARD-EDGE"

STANDARD STEEL BLADES . . . for general all-purpose cutting by machinists, mechanics, electricians, plumbers and maintenance men.

HIGH SPEED "M"-HAX

HIGH SPEED "M"-HAX BLADES . . . for fast, dependable cutting and long life on a variety of steels.

HIGH SPEED "T"-HAX

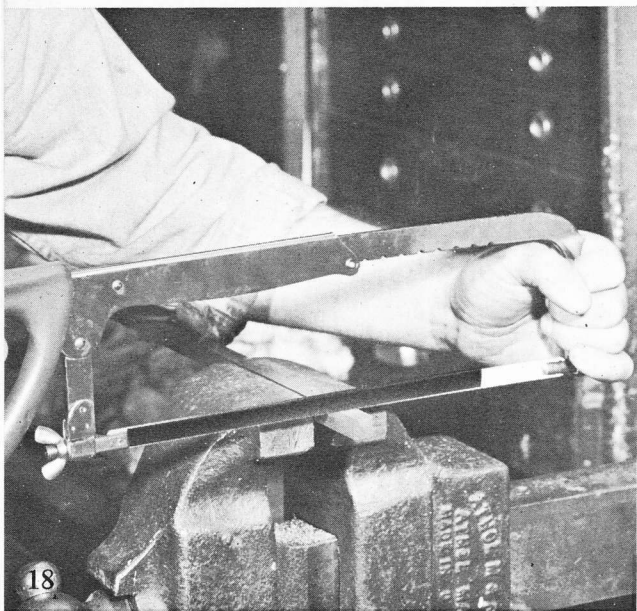
HIGH SPEED "T"-HAX BLADES . . . with the heat resistant property necessary for cutting tough alloy steels.

CHOOSE THE RIGHT EDGE

Each of the three types of Heller Hand Blades is available in "Hard-Edge" or "All-Hard".

"HARD-EDGE" Blades are best for general purpose cutting. They are heat treated only on the tooth edge. The body of the blade remains tough and flexible to resist breakage under severe conditions.

"ALL-HARD" Blades are heat treated for uniform hardness throughout. This gives them the stiffness preferred by skilled mechanics for straight, true cuts. They are recommended only where work is securely held.



Saw Blades

OR "ALL-HARD"

CHOOSE THE RIGHT TOOTH SIZE!

14T BLADES are designed to cut aluminum, brass, bronze, copper and soft steel of large cross section. Large gullets prevent clogging. Regular set.

18T BLADES are recommended for cutting light angle iron, iron pipe and tool steels. Best for general shop use. Regular set.

24T BLADES are preferred for cutting drill rod, medium sheet metal, tubing and hard materials in general. Wavy set.

32T BLADES are best suited for cutting thin sheet metal and thin wall tubing. Wavy set.

1"

SPECIFICATIONS ORDER BY PART NUMBER			STANDARD Steel		HIGH SPEED “M”-HAX		HIGH SPEED “T”-HAX	
Length and Width	Thick- ness	No. Teeth per Inch	HARD EDGE Part No.	ALL HARD Part No.	HARD EDGE Part No.	ALL HARD Part No.	HARD EDGE Part No.	ALL HARD Part No.
10" x 1½"	.025	18	30-1018	30A-1018	31-1018	31A-1018	32-1018	32A-1018
		24	30-1024	30A-1024	31-1024	31A-1024	32-1024	32A-1024
		32	30-1032	30A-1032	31-1032	31A-1032	32-1032	32A-1032
12" x 1½"	.025	14	30-1214	30A-1214	31-1214	31A-1214	32-1214	32A-1214
		18	30-1218	30A-1218	31-1218	31A-1218	32-1218	32A-1218
		24	30-1224	30A-1224	31-1224	31A-1224	32-1224	32A-1224
		32	30-1232	30A-1232	31-1232	31A-1232	32-1232	32A-1232
PACKED 100 BLADES IN A BOX		10" BLADES → Weight per 100: 3¼ lbs. 12" BLADES → Weight per 100: 4 lbs.			Weight per 100: 3½ lbs. Weight per 100: 4½ lbs.		Weight per 100: 4¼ lbs. Weight per 100: 4¾ lbs.	

This list comprises all types, sizes, and tooth spacings that will be regularly carried in stock. Anything differing from these Hack Saws will be considered as special and will not be manufactured except in cases of urgent necessity.

Heller

"Job Tempered"

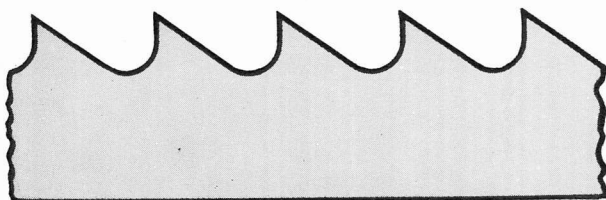
METAL CUTTING

Band Saws

- STANDARD HARD EDGE
- HIGH SPEED STEEL

STANDARD HARD EDGE

STANDARD TOOTH SHAPE



Specify **Standard Tooth** saws for cutting most ferrous metals and such non-ferrous materials as hard brasses and bronzes. Well rounded gullets have ample capacity for chips developed in cutting harder materials. Also specify this tooth shape for friction sawing.

HELLER SAWS WITH STANDARD TOOTH

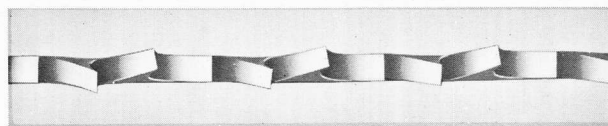
Width Inches	Thick-ness	Teeth per Inch							
1/8	.025	—	—	—	—	14	18	24	—
3/16	.025	—	—	10	—	14	18	—	—
1/4	.025	—	—	10	12	14	18	24	32
3/8	.025	—	8	10	—	14	18	—	—
1/2	.025	6	—	10	—	14	18	—	—
5/8	.032	—	8	10	—	14	18	—	—
3/4	.032	6	8	10	12	14	—	—	—
1	.035	6	8	10	—	14	—	—	—

Furnished in 100' and 250' coils or cut to specified length and welded ready for use.

STANDARD HARD EDGE

REGULAR SET

Specify **Regular Set** for cutting material of uniform size and for contour cutting. Regular Set consists of a repeated 3-tooth sequence of one tooth set to the left, one tooth set to the right, and one unset tooth called a raker. Regular Set Saws are furnished with 6 to 24 teeth per inch.



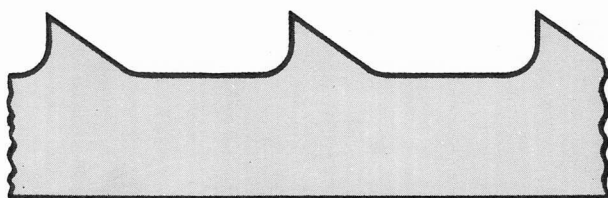
HELLER SAWS WITH REGULAR SET

Width Inches	Thick-ness	Teeth per Inch							
1/8	.025	—	—	—	—	14	18	24	—
3/16	.025	—	—	10	—	14	18	—	—
1/4	.025	—	—	10	12	14	18	24	—
3/8	.025	—	8	10	—	14	18	—	—
1/2	.025	6	—	10	—	14	18	—	—
5/8	.032	—	8	10	—	14	18	—	—
3/4	.032	6	8	10	12	14	—	—	—
1	.035	6	8	10	—	14	—	—	—

Furnished in 100' and 250' coils or cut to specified length and welded ready for use.

STANDARD HARD EDGE

SKIP TOOTH SHAPE



Specify **Skip Tooth** saws for cutting soft materials that form large chips. They supply more gullet capacity without weakening the body of the saw. So, they're ideal for cutting aluminum, copper, magnesium and soft brasses. Skip Tooth saws also provide high-speed, low-cost cutting for wood, plywood, plastics and composition materials.

HELLER SAWS WITH SKIP TOOTH

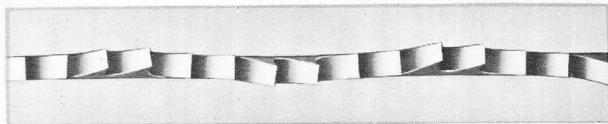
Width Inches	Thick-ness	Teeth per Inch Regular Set			
3/16	.025	—	—	4	—
1/4	.025	—	—	4	6
3/8	.025	—	3	4	—
1/2	.025	—	3	4	—
3/4	.032	—	3	—	—
1	.035	2	3	—	—

Furnished in 100' and 250' coils or cut to specified length and welded ready for use.

STANDARD HARD EDGE

WAVY SET

Specify **Wavy Set** when thin stock or work variety creates a tooth-breakage problem. Wavy Set consists of groups of teeth set alternately to the left and right. This spreads cutting strain over *groups* of teeth instead of confining it to individual teeth. As a result, a wide variety of shapes and sizes of material can be cut with the same blade. Wavy Set Blades are furnished with 8 to 32 teeth per inch.

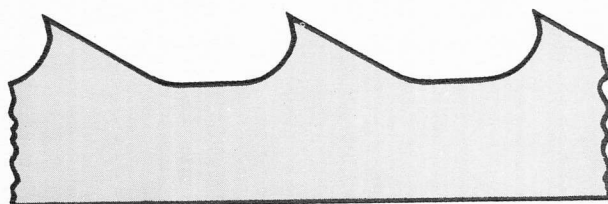


HELLER SAWS WITH WAVY SET

Width Inches	Thick- ness	Teeth per Inch					
1/4	.025	—	—	—	—	—	32
1/2	.025	—	10	—	14	—	24
3/8	.032	—	10	—	14	—	—
3/4	.032	8	10	12	14	18	—
1	.035	—	10	—	—	—	—

Furnished in 100' and 250' coils or cut to specified length and welded ready for use.

STANDARD HARD EDGE HOOK TOOTH SHAPE



Specify **Hook Tooth** saws for easier feeding and faster cutting in soft or gummy materials. The 10° hook on the face or cutting edge of each tooth *makes* the saw feed easier. Its chip breaker design keeps the gullet clean — prevents clogging. The main advantage of this style tooth is that it will do more work at lower cost than the conventional Skip Tooth on many applications.

HELLER SAWS WITH HOOK TOOTH

Width Inches	Thick- ness	Teeth per Inch Regular Set			
1/4	.025	—	—	4	6
3/8	.025	—	3	4	6
1/2	.025	2	3	4	6
3/4	.032	2	3	—	6
1	.035	2	3	—	6

Furnished in 100' and 250' coils or cut to specified length and welded ready for use.



HIGH SPEED STEEL Band Saw Blades

STANDARD BLADE

Designed for production cutting of ferrous metals . . . Heller's Standard High Speed Steel Blade can be operated at faster speeds and feeds than Hard Edge type blades. Its greater resistance to wear and breakage means stepped-up production with less downtime for blade changing. Operated on heavy duty machines with back and side guides accurately aligned and not worn, this High Speed Steel Saw will give maximum on-the-job results. Furnished welded-to-length and individually packaged in all of the standard specifications listed below.

Ultra BLADE

A radically new metallurgical approach builds unbeatable durability into Heller's Ultra High Speed Steel Blade. Special steel analysis (Patent Applied For), advanced production methods, closer heat-treating control, stronger welds, 100% inspection . . . means they can be operated at much greater cutting feeds and speeds with attendant savings. Designed specifically to meet today's needs in production cut-off work on ferrous metals, these blades will give up to 3 times better performance than any other High Speed Steel blade yet costs only slightly more than our Standard High Speed Steel Blade. Furnished welded-to-length and individually packaged in all of the standard specifications listed below.

SPECIFICATIONS — REGULAR SET

Width Inches	Thick- ness	Standard Tooth				Skip Tooth	Hook Tooth			
1/2	.025	—	—	—	10	—	4	—	—	—
3/4	.032	—	6	8	10	3	—	—	3	—
1	.035	4	6	8	10	3	—	2	3	4
1 1/4	.042	—	6	—	—	3	—	—	3	—

Furnished welded-to-length, protectively packaged, ready to use.

Heller "Job Tempered"

FLAT GROUND Die Steel



... THE ANALYSIS RECOMMENDED BY LEADING CONSULTING METALLURGISTS

It's a fact! Leading consulting metallurgists back up *your* judgment when you specify Heller Flat Ground Die Steel. In their professional opinion, the Heller analyses for both oil hardening and air hardening types are metallurgically *right* to give superior results.

And Heller's simple heat treating instructions insure that you get all the advantages of Job Tempered tools and parts made from this steel . . . unwarped, true dimensions; tough, long wearing qualities; long service under the most severe shop conditions.

All Heller Die Steel is spheroidize annealed for easy machining and uniform hardening. Both the oil and air types have wide hardening ranges and are non-deforming, so shrinkage and warping are minimized. This is why you can be sure of getting better, more uniform results and greater satisfaction when you specify "Heller" Flat Ground Die Steel.

READY FOR IMMEDIATE USE

Heller Die Steel comes to you ready for scribing, shaping and heat treating. All scale, decarburization and surface defects have been removed. Costly machining-to-size operations are eliminated. Low micro-inch surface finish expedites accurate layout. Tool and die makers and machinists save valuable time. It's the modern way to get the lowest unit cost on tools, dies, jigs, fixtures and a large variety of parts!

FULL RANGE OF STOCK SIZES

On-the-shelf, ready to use stock sizes range from $\frac{1}{8}$ " to 2" thick . . . $\frac{1}{2}$ " to 14" wide . . . in flat and a wide range of square sizes. Oil Hardening Die Steel comes in both 18" and 36" lengths; Air Hardening in 36" lengths only (see chart on back page). Special sizes are promptly made to order.

CONVENIENTLY PACKAGED

All sizes of Heller Job Tempered Die Steel are individually wrapped in protective packages . . . with dimensions and heat-treating directions prominently displayed.

1 OIL HARDENING

CHROMIUM-TUNGSTEN TYPE FOR GENERAL PURPOSES

A.I.S.I. or S.A.E Type No. 01 Analysis

You can safely specify this Heller non-deforming type steel for all but highly abrasive applications. This Chromium-Tungsten Type Alloy steel will give excellent wear resistance when used as tools and dies for shaping non-ferrous metals, the milder ferrous metals, and alloy steels.

APPLICATIONS

Dies	Templates
Punches	Stamps
Jigs	Shims
Gauges	Machine Parts
Fixtures	Small Tools
... And Comparable Items	

2 AIR HARDENING

5% CHROME TYPE FOR WEAR RESISTANCE

A.I.S.I. or S.A.E. Type No. A2 Analysis

Specify Heller Air Hardening Die Steel when you want greater production from punches and dies between sharpenings. You can produce up to 50% more pieces per sharpening with this 5% chrome steel than with the Oil Hardening Type. Remember, too, that Air Hardening type steels provide a greater margin of safety when hardening intricate sections and deform less in heat treatment than oil hardening types.

APPLICATIONS

PUNCHES AND DIES for shaping silicon or stainless steels, Monel metal and other abrasive metals.

GAUGES, TOOLS AND PARTS when high wear resistance is desired.

High Grade Alloy Tool Steel

SPECIFICATIONS

CHEMICAL ANALYSIS:

Carbon85-.95
Manganese . . .1.00-1.25
Silicon20-.40
Chromium40-.60
Tungsten40-.60
Vanadium . . .10-.20

SIZE TOLERANCES:

Thickness: $\pm .001''$
Width: $\pm .005-.000''$ (18" Lengths)
 $\pm .015-.000''$ (36" Lengths)
Length: 18" $\pm \frac{1}{32}''$ (Ends milled)
36" $\pm \frac{1}{8}''$ (Ends saw cut)

HARDENING RANGE:

1450° to 1500°F.—Quench in oil 125°F.
Full heat-treating instructions, including tempering chart on each package.

SURFACE FINISH:

25 to 35 micro inches with all decarburization and surface defects removed.

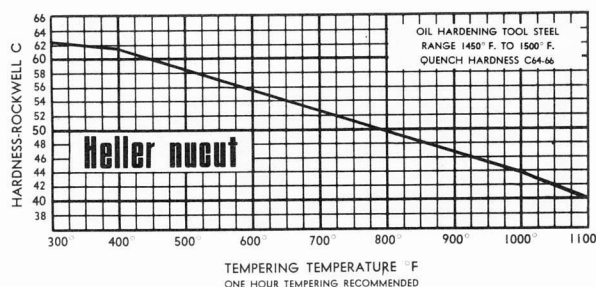
HEAT TREATMENT

HARDENING — You can satisfactorily quench all thicknesses in oil from a hardening temperature of 1450 to 1500°F.

Do not quench in water since this alloy is Oil Hardening. Be sure the stock is thoroughly and uniformly heated before quenching. Temperature of the oil quench should be about 125°F.

Commercial quenching oils are preferred, but motor engine oil SAE 20 or 30 may be safely used. To prevent fires, don't let the quenching oil get too hot. The flash point of motor engine oil SAE 20 is about 340°F.

TEMPERING CHART



For specific Rockwell hardness, use the above chart as your guide.

COLOR TEMPERING

For filing temper — heat to a very dark blue.

For grinding temper — heat to a light straw color.

ANNEALING

Heat to 1425°F for 1 hour — cool slowly in furnace to 1000°F — pack anneal recommended.

High Grade Alloy Tool Steel

SPECIFICATIONS

SIZE TOLERANCES:

Thickness: $\pm .001''$ Width: $\pm .015''-.000''$
Length: 36" $\pm \frac{1}{8}''$ (Ends saw cut)

HARDENING RANGE:

1700° to 1800°F.— Harden at 1750°F.— Heat uniformly throughout, then soak for 15-20 minutes. Cool in still air.

Full heat-treating instructions, including tempering chart, on each package.

SURFACE FINISH:

25 to 35 micro inches with all decarburization and surface defects removed.

HEAT TREATMENT

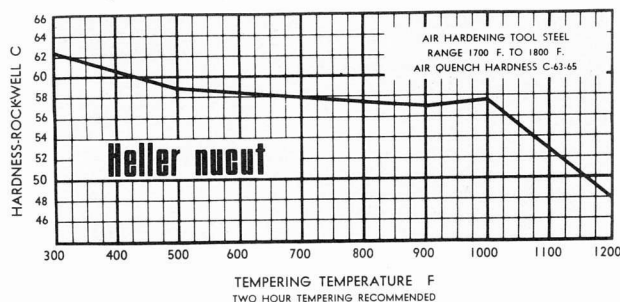
HARDENING — 1750°F is the target temperature; but 1700° to 1800°F is a safe range. Use the high side for thick sections.

Heat uniformly and soak for 15 to 20 minutes.

Cool in still air. For pack or controlled atmosphere furnace methods, no preheat is needed. For the open furnace method, use a 1450°F preheat to minimize decarburization.

TEMPERING

Refer to chart below for desired hardness. Temper for two hours. For extra toughness, temper *twice* for 1½ hours each. For light blanking, temper at 400° to 425°F. For heavy blanking, temper at 700°F.



ANNEALING

1525°F to 1575°F. For maximum softness, cool by decreasing temperature 50 degrees per hour to 800°F.

CHEMICAL ANALYSIS

Carbon95-1.05
Manganese50-.70
Silicon30-.50
Chromium5.00-5.50
Molybdenum . . .90-1.10
Vanadium . . .20-.30

SQUARE STOCK SIZES

OIL HARDENING 18" LENGTHS

$\frac{7}{64}$	$\frac{1}{8}$	$\frac{9}{64}$	$\frac{5}{32}$	$\frac{11}{64}$	$\frac{3}{16}$	$\frac{13}{64}$	$\frac{7}{32}$	$\frac{15}{64}$	$\frac{1}{4}$	$\frac{9}{32}$
$\frac{5}{16}$	$\frac{11}{32}$	$\frac{3}{8}$	$\frac{13}{32}$	$\frac{7}{16}$	$\frac{15}{32}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$
$\frac{13}{16}$	$\frac{7}{8}$	1	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	2	$2\frac{1}{2}$	$2\frac{3}{4}$

OIL HARDENING 36" LENGTHS

$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	2	$2\frac{1}{2}$	$2\frac{3}{4}$	3
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AIR HARDENING 36" LENGTHS

$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
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"Job Tempered"

FLAT
GROUND

Die Steel

STANDARD STOCK SIZES

AIR HARDENING

Widths

10	8	7	6	5½	5	4½	4	3½	3	2½	2	1½	1¼	1
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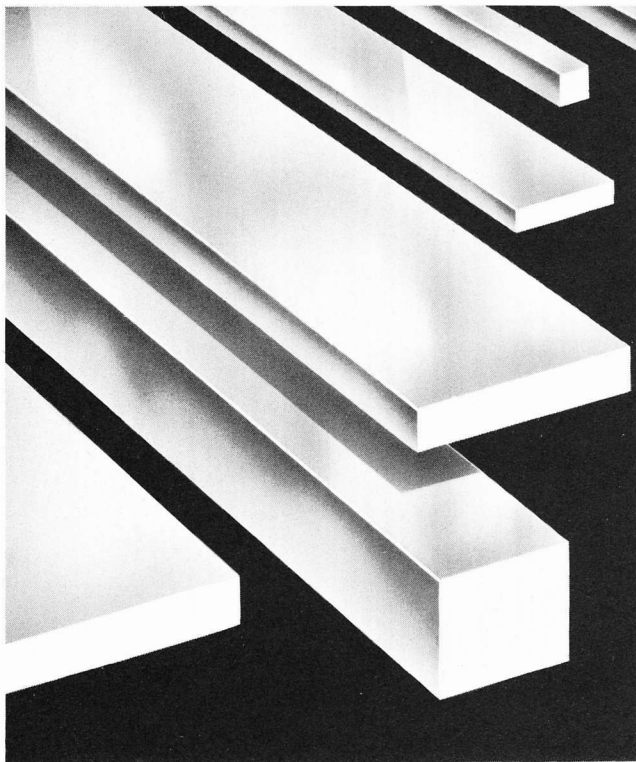
Thickness

Length

OIL HARDENING

Widths

[illegible]



Heller nucut

"Job Tempered"

LOW CARBON

Flat Ground STEEL

**FOR FIXTURES, MACHINE PARTS,
JIGS, STRIPPER PLATES, ETC.**

Heller now offers a Low Carbon Steel which gives substantial savings in applications where a heat treated steel is not required, such as templates, stripper plates, etc. This is a fine grained, forging quality, silicon killed steel which can be case hardened only.

Due to its fine grain structure, this steel is more ductile, tougher, more uniformly machineable and has excellent welding qualities. Close control of various mill practices . . . chemical composition, pouring, forging, rolling, cooling, etc. plus the addition of silicon to the liquid metal which de-oxidizes or "kills" the steel . . . produces a much sounder structure with excellent forging qualities.

Precision ground with an extra smooth surface finish for accurate layout purposes, standard stock sizes are available from $\frac{1}{16}$ " to $1\frac{1}{2}$ " thick, $\frac{1}{2}$ " to 16" wide and in $\frac{3}{8}$ " to $2\frac{7}{8}$ " squares — see complete list of sizes on other side.

Stock sizes are now available in 24" lengths. All sizes are individually packaged, fully protected from rusting and scratching with dimensions clearly indicated. Standard stock sizes are ready for immediate delivery by industrial supply distributors and steel warehouses. Special sizes promptly furnished on order.

TYPICAL CHEMICAL ANALYSIS

Carbon18	Silicon20
Manganese50	Sulphur04
Phosphorus04		

SPECIFICATIONS

SIZE TOLERANCES:

Thickness: $\pm .001$ "
Width: $+.005 - .000$ " (Edges ground on pieces $\frac{3}{4}$ " thick or less — Edges milled on pieces over $\frac{3}{4}$ " thick)
Length: $24" + \frac{1}{4}" - 0"$ (Ends saw cut or sheared)

HARDENING:

Can be case hardened only.

SURFACE FINISH:

25 to 35 micro inches.

Heller nucut

MADE IN UNITED STATES OF AMERICA

LOW CARBON



24" x 4" x $\frac{1}{4}"$

"Job Tempered"
Flat Ground Steel
A FINE GRAINED, FORGING QUALITY
SILICON KILLED STEEL

TYPICAL CHEMICAL ANALYSIS			
C. 18	Min. 30		
Si. 20	Phos. & Sul. .04		
HEAT TREATMENT BY CASE HARDENING ONLY			

24" x 4" x $\frac{1}{4}"$

LOW CARBON FLAT GROUND STEEL

Precision Ground • Individually Packaged • Immediate Delivery

STANDARD STOCK SIZES • FLATS AND SQUARES

 EACH THICKNESS IS FURNISHED IN EVERY WIDTH IN ADJOINING COLUMNS

LENGTH 24"	
Thickness	Width
$\frac{1}{16}$	$\frac{1}{2}$ $\frac{3}{4}$
$\frac{3}{32}$	1 $1\frac{1}{4}$ $1\frac{1}{2}$
$\frac{1}{8}$	2 $2\frac{1}{2}$ 3 $3\frac{1}{2}$ 4 5 6 8 10 12
$\frac{5}{32}$	
$\frac{3}{16}$	
$\frac{1}{4}$	

LENGTH 24"	
Thickness	Width
$\frac{5}{16}$	$\frac{1}{2}$ $\frac{3}{4}$ 1 $1\frac{1}{4}$ $1\frac{1}{2}$
$\frac{3}{8}$	2 $2\frac{1}{2}$ 3 $3\frac{1}{2}$ 4 5 6 7 8 9 10 12
$\frac{1}{2}$	
$\frac{5}{8}$	
$\frac{3}{4}$	

LENGTH 24"	
Thickness	Width
$\frac{7}{8}$	1 $1\frac{1}{4}$ $1\frac{1}{2}$ 2 $2\frac{1}{2}$ 3 $3\frac{1}{2}$ 4 5 6 7 8 9 10 12 14 16
NOT FURN. IN 14" & 16"	
1	
NOT FURN. IN 14" & 16"	
$1\frac{1}{4}$	
NOT FURN. IN 1"	
$1\frac{1}{2}$	
NOT FURN. IN 1" & $1\frac{1}{2}$ "	

SQUARE SIZES

$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$
$\frac{13}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	1	$1\frac{1}{16}$	$1\frac{1}{8}$	$1\frac{3}{16}$
$1\frac{1}{4}$	$1\frac{5}{16}$	$1\frac{3}{8}$	$1\frac{7}{16}$	$1\frac{1}{2}$	$1\frac{9}{16}$	$1\frac{7}{8}$
	2	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{7}{8}$	

SPECIAL SIZES PROMPTLY MADE TO ORDER

Easily Machined — Excellent Welding Quality — Case Harden If Heat Treatment Is Required